Política Fiscal

y

Distribución

Personal

y **Regional**

del

Ingreso

en la Argentina

Walter Cont / Alberto Porto

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Política Fiscal y Distribución Personal y Regional del Ingreso en la Argentina

Introducción.

Este volumen recopila seis trabajos de investigación, realizados por los autores, sobre Política Fiscal y distribución del ingreso en la Argentina. Se presentan desarrollos teóricos, mediciones y resultados.

Todos los trabajos han sido presentados en Congresos y Reuniones Científicas en el país y en el exterior y han sido publicados en distintos medios (Revistas y Anales de Congresos). La publicación de este libro tiene como finalidad reunir los trabajos de modo de facilitar la difusión y lectura.

El primero de los trabajos "*Presupuestos Provinciales, Transferencias y Equidad*" fue realizado en 1996, presentado en las *Segundas Jornadas de Investigación en Economía*, organizadas por la Carrera de Economía de la Facultad de Ciencias Económicas de la Universidad de Buenos Aires; y publicado en el número especial de *Desarrollo Económico,* Vol. 38, 1998. Las mediciones correspondieron al año 1991 y se destacó especialmente la severa restricción de información para poder realizar este tipo de estimaciones. El trabajo concluye que los presupuestos provinciales mejoran el ingreso personal en todas las provincias y a nivel agregado de todo el país. Los determinantes de ese resultado (progresividad y tamaño) difieren entre provincias. Por su parte, la ejecución presupuestaria provincial tiene efectos complementarios en las distribuciones personal y regional del ingreso.

Varios años después se retomó esta línea de investigación aprovechando la mayor disponibilidad de datos. En 2009 se presentó el trabajo "*Personal and Regional redistribution through public finance. The case of provincial governments in Argentina*" en la XLIV Reunión Anual de la Asociación Argentina de Economía Política (AAEP), actualizando el estudio realizado en 1996. El trabajo se publicó en los Anales de esa reunión. Se estudió el impacto del presupuesto público provincial (que representa aproximadamente mitad del gasto público consolidado, mientras que aproximadamente 60% de los recursos para afrontarlo provienen de regí-

menes de transferencias) sobre la distribución del ingreso en Argentina utilizando información presupuestaria del año 2004. El trabajo revela la importancia de considerar el impacto de la política fiscal sobre la distribución del ingreso a nivel provincial, ya que los efectos difieren por provincia y la agregación de provincias esconde efectos interprovinciales (de provincias financiadoras a provincias receptoras netas). En las provincias receptoras netas la progresividad del presupuesto provincial se refuerza por el efecto (positivo) de las transferencias mientras en las jurisdicciones financiadoras (3 jurisdicciones) se produce un conflicto entre progresividad y el efecto (negativo) de las transferencias. En este grupo, sin embargo, el efecto neto del presupuesto provincial es progresivo.

En 2010 se continuó en esta temática considerando el impacto de la política fiscal nacional en el trabajo *"Personal and Regional redistribution through the national budget in argentina. 2004"*. Este trabajo fue presentado en las 43° Jornadas Internacionales de Finanzas Públicas. Para este nivel de gobierno, se estimó un impacto positivo sobre la distribución personal del ingreso tanto a nivel agregado como de cada jurisdicción provincial. El impacto positivo es el efecto neto de gastos progresivos e impuestos regresivos. Los impactos nuevamente son diferentes a nivel de provincias. En las provincias perdedoras netas en la redistribución regional (en este caso, el número se amplía a 8 jurisdicciones), el efecto progresivo del presupuesto sobre la distribución personal del ingreso entra en conflicto con el efecto negativo sobre la distribución personal, de modo que el cambio en el bienestar puede ser negativo para funciones de bienestar con un coeficiente pequeño de aversión a la desigualdad.

Los trabajos de 2009 y 2010 confluyeron en el estudio del impacto conjunto de la actividad fiscal de los dos niveles de gobierno, que se documentó en *"Personal and Regional redistribution through the national and provincial budgets in argentina. 2004"*. Este trabajo fue presentado en la XLV Reunión Anual de la AAEP (2010) y publicado en los Anales de esa reunión. Una versión resumida fue publicada en el Vol 54 del *Quarterly Review of Economics and Finance,* 2014*.* Este trabajo estudia el impacto del presupuesto consolidado nación-provincias sobre la distribución personal y regional del ingreso en la Argentina en el año 2004, a nivel agregado (nacional) y desagregado (provincias). Se concluye que el presupuesto público consolidado tiene un efecto agregado positivo sobre la distribución personal del ingreso, que resulta de la combinación de gastos progresivos e impuestos levemente regresivos. Estos impactos son diferentes a nivel de provincias y del nivel de gobierno que ejecuta el presupuesto. El presupuesto nacional redistribuye ingreso entre provincias (como se mencionó antes, ocho provincias son perdedoras en la redistribución). No obstante, en todas las provincias la distribución personal

mejora. A nivel provincial el impacto distributivo es positivo (principalmente a través de la progresividad del gasto provincial), interactuando con las transferencias nacionales, de modo tal de reforzar la progresividad en las provincias receptoras netas y creando un conflicto en las tres jurisdicciones. A nivel consolidado, 7 jurisdicciones financian al resto de las jurisdicciones (compensándose parcialmente la dimensión regional de la ejecución presupuestaria nacional y provincial), y no se observa incompatibilidad entre los efectos redistributivos de los presupuestos nacional y provinciales.

Luego de haber estudiado en detalle los efectos de la ejecución de presupuestos nacional y provinciales sobre las dos dimensiones de distribución del ingreso (personal y regional), la agenda de investigación avanzó en el análisis intertemporal de las mismas, para el período 1995-2010.

El trabajo *"Fiscal Policy and Income distribution: Measurement for Argentina 1995-2010"* se publicó en el Vol 6 de la revista *Review of Economic and Finance* - Academic Research Center of Canadá, 2016, siendo una versión resumida del documento "*The effect of fiscal policy on personal and regional distribution of income. Argentina 1995 - 2010"*, presentado en la L Reunión Anual de la AAEP (2015) y publicado en los Anales de esa reunión.

En este estudio se confirmó un resultado persistente de efecto positivo de la ejecución presupuestaria sobre la distribución del ingreso, mostrando mayor impacto en el período 2003-2010 respecto del período 1995-2001. Nuevamente, el instrumento con mayor efecto redistributivo es el gasto, en especial, el gasto provincial. Sin embargo, el segundo período se sesgó hacia transferencias monetarias, en contra de gastos en especie (que son los que adoptan la forma tradicional de bien público). Asimismo, enfocando por la finalidad del gasto, este segundo período muestra un crecimiento de gastos en servicios económicos, disminuyendo el peso dominante de los gastos en servicios sociales. En una muestra de largo plazo, se confirma los resultados puntuales de complementariedad de la política fiscal sobre las dimensiones personal y regional de la distribución del ingreso, aunque de menor peso en el período 2003-2010.

El último trabajo recopilado en el libro, *"Geografía de la desigualdad en la distribución personal del ingreso y en el impacto distributivo de la política fiscal. Argentina. 1995-2010"*, extendió el trabajo anterior a un nivel detallado de jurisdicciones provinciales (provincias y la Ciudad Autónoma de Buenos Aires). El documento fue presentado en la LI Reunión Anual de la AAEP (2016) y publicado en los Anales de esa reunión. Partiendo de una situación de notables diferencias en la desigualdad del ingreso de mercado entre provincias, se estima que la política fiscal tiene un fuerte impacto sobre la desigualdad, produciendo reordenamientos im-

portantes en el ranking de desigualdad (comparado el ranking ex post con el que ranking de desigualdad de mercado). Este trabajo muestra el efecto redistributivo creciente de las transferencias en dinero vs las transferencias en especie, y la disminución del efecto redistributivo de los presupuestos provinciales, resultado consistente con la centralización fiscal en el segundo periodo 2003-2010.

De este detalle surgen varias reflexiones. En primer lugar, se destaca el gran esfuerzo detrás de la construcción de datos para poder obtener conclusiones significativas. Por ello, se agradece a C. Peluffo (coautora en un trabajo), A.Garriga, L. Longo y M. Minatta (por su excelente colaboración) y a los varios comentaristas que se han tomado el trabajo de leer cada documento y aportar múltiples observaciones que han sido útiles para la mejora de cada uno de ellos. En segundo lugar, los resultados obtenidos permiten tener una idea del efecto distributivo de los distintos instrumentos de política fiscal, interpretándolos según distintos tipos de descomposiciones (nacional-provincial, impuesto-gasto, efectivo-especie, gasto social-económico, impuestos directos-indirectos, etc.). Son muchos resultados para poder sintetizar en pocas líneas, pero cada uno de ellos es muy útil para tener una medida del efecto redistributivo de una u otra medida de política económica que afecte cuantitativamente las distintas dimensiones de las herramientas fiscales. En este sentido, se refiere al lector a cada uno de los capítulos para profundizar los distintos enfoques de su interés. Por último, y en lo que respecta a la dimensión académica, se espera que este libro sirva como motivador para futuras agendas de investigación, ilustrando cómo a partir de "poco" se pueden generar preguntas que mantienen viva la necesidad de estudiar un tema por dos décadas.

ÍNDICE

Presupuestos provinciales, transferencias intergubernamentales y equidad*

Alberto Porto y Walter Cont**

Resumen.

El objetivo de este trabajo es indagar sobre e impacto distributivo de los presupuestos provinciales en la Argentina (año 1991); como más del 50% del gasto provincial es financiado con transferencias nacionales, se trata de responder la misma pregunta relativa a esos regímenes. El ensayo es altamente speculativo ya que las cuantificaciones se realizan en base a información escasa y no totalmente confiable; de esa forma los resultados deben tomarse como provisorios y desafiables.

Es importante notar que el objetivo de equidad distributiva ha estado presente en los regímenes de coparticipación de impuestos entre la Nación y las provincias desde su nacimiento, a mediados de la década de los treinta. La Constitución Nacional de 1994, al otorgarle jerarquía constitucional al régimen de coparticipación, establece que la distribución entre jurisdicciones "será equitativa, solidaria, y dará prioridad al logro de un grado equivalente de desarrollo, calidad de vida e igualdad de oportunidades en todo el territorio nacional" (Constitución Nacional, art. 75 inc. 2).

El análisis realizado en este trabajo sugiere que los presupuestos provinciales mejoran la distribución personal del ingreso; que en todas las provincias tanto los gastos como el financiamiento son progresivos; y que hay grandes diferencias entre las provincias en cuanto a los determinantes ("tamaño" y "progresividad"); que a nivel nacional los presupuestos provinciales y su financiamiento son progresivos y mejoran la distribución personal (agregada) del ingreso; y que los efectos sobre las distribuciones personal y territorial son complementarios.

Summary.

This paper explores the distributional impact of provincial budgets and national transfers to provinces in Argentina (199. Due to the scarcity and quality of the

data, conclusions are tentative and challengeable. Equity has been a goal of revenue sharing since its birth in the 30s. The Constitution of 1994 grants constitutional status to the system by establishing that the distribution among the provinces should be equal, fair, and should foster equal development, equal standard of life and equal opportunities nationwide . Results suggest that provincial budgets improve the personal distribution of income; that in all provinces both expenditures and financing are progressive; that there exist significant differences among provinces with regard to determinants (size of budget and progressivity); that at a national level provincial budgets and their financing are progressive and improve the aggregate personal distribution of income; and finally, that the effects on personal and territorial distribution are complementary.

1. Introducción.[1]

El objetivo de este trabajo es indagar sobre el impacto distributivo de los presupuestos provinciales en la Argentina (año 1991); como más del 50%del gasto provincial es financiado con transferencias nacionales, se trata de responder la misma pregunta relativa a esos regímenes. Es importante notar que el objetivo de equidad distributiva ha estado presente en los regímenes de coparticipación de impuestos entre la Nación y las provincias desde su nacimiento, a mediados de la década de los '30. Además de mejorar la planificación de las finanzas provinciales, aprovechar las economías de escala en la recaudación e igualar la carga tributaria para todos los habitantes, los regímenes se proponían lograr una "distribución equitativa beneficiando a los distritos pobres con el excedente de las regiones con recursos fáciles y abundantes".

Este objetivo permaneció vigente en el tiempo. Por ejemplo, en el Mensaje de Elevación de Proyecto de la Ley 20.221/73 -que rigió entre 1973 y 1984 y que constituyó el régimen más elaborado y fundamentado de transferencias entre la Nación y las provincias- se expresa que uno de los objetivos es "reconocer la necesidad de un tratamiento diferencial a las provincias con menores recursos, a efectos de posibilitar a todas ellas la provisión de los servicios públicos a su cargo en niveles que garanticen la igualdad de tratamiento de todos los habitantes". Para el logro de ese objetivo se estableció que el 25% del total correspondiente a las provincias se distribuyera según el criterio "Brecha de Desarrollo", que mide la diferencia de riqueza de cada provincia con respecto a la del área más desarrollada del país.

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1.   Este trabajo es parte de un estudio más detallado en el que se realizaron diferentes supuestos sobre asignación de impuestos y gastos para las provincias (Porto y Cont, 1996).

La Constitución Nacional de 1994, al otorgarle jerarquía constitucional al régimen de coparticipación, establece que la distribución entre las jurisdicciones "será equitativa, solidaria, y dará prioridad al logro de un grado equivalente de desarrollo, calidad de vida e igualdad de oportunidades en todo el territorio nacional" (Constitución Nacional, art.75. inc. 2).

Algunas cuestiones relevantes son las siguientes: (i)¿cuál es el ordenamiento de las provincias en cuanto a la distribución inicial del ingreso?; (ii) ¿cuál es el impacto de los presupuestos provinciales sobre la distribución del ingreso?; (iii) el régimen de coparticipación federal de impuestos que implica una fuerte redistribución regional de recursos, ¿mejora o empeora la distribución personal del ingreso?; (iv) dado que el impacto sobre la distribución del ingreso depende, por un lado de la progresividad del presupuesto y, por otro lado, de su tamaño, ¿qué ordenamiento de las provincias puede hacerse en base a esas dos dimensiones?; (v) ¿individuos con ingresos similares pero que pertenecen a diferentes provincias, reciben el mismo tratamiento fiscal? El ensayo es altamente especulativo ya que se cuantifican las relaciones utilizando información muy escasa y no totalmente confiable; de esa forma los resultados deben tomarse como provisorios y desafiables[2]. Pero la relevancia para la política económica justifica tanto el trabajo realizado como las respuestas al desafío que se lanza.

El trabajo está organizado de la siguiente forma:

En la sección II se plantea el tema de la relación entre distribución personal y regional del ingreso. En la sección III se presenta información sobre las variables provinciales (PBI y datos de ejecución presupuestaria) y sobre el impacto de la política fiscal sobre la distribución del ingreso en cada provincia. En la sección IV se computa el impacto distributivo para el conjunto de provincias. En la sección V se calcula la desigualdad en la distribución del ingreso a nivel nacional y se descompone en tres efectos: desigualdad dentro de cada provincia, diferencia de ingresos medios entre provincias y superposición de ingresos entre grupos de distintas provincias. Se estima también el cambio en la desigualdad debido a la acción fiscal. Por último, en la sección VI se presentan las conclusiones.

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2. Kuznets (1955) consideraba que sus estimaciones debían considerarse un 5% de información empírica y un 95% de especulación. Creemos que el componente especulativo es en nuestro caso menor o igual. Algunos de los argumentos de Kuznets constituyeron un estímulo para la realización de este trabajo. "... The subject is central; ... our knowledge of it is inadequate; ...as long as it is recognized as a collection of hunches calling for further investigation rather than a set of fully rested conclusions, tittle harm and much good may result..." (p. 26).

2. Redistribución personal y regional del ingreso. [3][4]

El sector público, en la medida en que provee bienes a precio cero financiando sus actividades con tributos que se apartan del principio de beneficio, redistribuye ingresos entre las personas. Si se considera la dimensión espacial y existen desequilibrios territoriales, en la medida en que el sistema tributario y la provisión de bienes sea uniforme a lo largo del territorio, el presupuesto público implicará no sólo redistribución entre personas sino también entre regiones. Lo anterior es válido ya sea que se trate de un gobierno nacional o provincial si es que no existe desequilibrio vertical (o sea, que los distintos niveles de gobierno se autofinancien).

De la teoría de las finanzas públicas y de la experiencia de casi todos los países del mundo resulta un sector público con varios niveles de gobierno y con mayor centralización de los impuestos que de los gastos. De esa forma el gobierno nacional es "superavitario" y los provinciales (estatales, municipales, etc.) "deficitarios". La brecha fisca a nivel local se compensa con "transferencias interjurisdiccionales". Estas transferencias se fundamentan tanto en consideraciones de eficiencia como de equidad. Cualquiera sea el fundamento de las redistribuciones regionales vía estas transferencias, resulta claro que también afectan la distribución personal del ingreso.

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3. En la teoría de las finanzas públicas, la división de funciones fiscales entre distintos niveles de gobierno ha ocupado un importante lugar. Una de las primeras contribuciones sobre el tema fue la de Musgrava (1959), que concluyó que: "... El tema central del federalismo fiscal de encuentra en la proposición de que debería permitirse que las políticas de la Rama de Asignación difieran entre los Estados, dependiendo de las preferencias de sus ciudadanos. Los objetivos de las Ramas de Estabilización y Distribución, sin embargo, requieren una responsabilidad primaria del Gobierno Central..." (pp. 181-182). La literatura posterior ha reconocido la existencia de restricciones para las políticas redistributivas descentralizadas, debido principalmente a la movilidad de bienes y factores entre regiones (Dates 1972; King, 1984; Brown y Oates, 1987). Desde el punto de vista teórico, el argumento para la centralización de las políticas redistributivas fue diseñado por Pauly (1973), utilizando el mismo argumento que para la Rama de Servicio (diversidad de preferencias sobre la redistribución entre las comunidades). Más recientemente, Wildasin (1992) analiza el efecto de la creciente movilidad de los factores a lo largo del tiempo -debido a reducción de los costos de transporte y comunicación y a la existencia de menos restricciones políticas e institucionales- como un factor limitante de la posibilidad de llevar a cabo políticas redistributivas autónomas, no sólo entre regiones dentro de un país, sino entre países. Una posición extrema sobre la cuestión ha sido expuesta por Prud´homme (1996), que ve la descentralización como la "madre de la segregación" y sostiene que es difícil pensar en un país que lleve a cabo políticas redistributivas a nivel subnacional. Sobre esta cuestión, se coincide con el comentario de Sewell (1996) que sostiene, a diferencia de lo expuesto por Prud´homme, que lo difícil es hallar un país en el que los gobiernos subnacionales no diseñen y ejecuten políticas públicas con impacto distributivo. No es raro que esto sea así ya que, como expresa Bird (1995), "Instead, a government whether local or central, that is not concerned with distribution is less a government that simply one of the many alternative organizational structures that may be used to deliver certain services".

4. Para más detalles, ver Porto y Sanguinetti (1995, 1996).

Una de las cuestiones importantes en el análisis del régimen argentino de transferencias intergubernamentales (coparticipación federal y otras) es el impacto sobre la distribución personal y regional del ingreso. Existe la clara evidencia acerca de la fuerte redistribución regional implicada por el régimen argentino de transferencias (porto, 1990; Porto y Sanguinetti, 1995 y 1996). La pregunta siguiente es la de su impacto sobre la distribución personal, objeto de este trabajo. En el gráfico 1 se presenta –para una provincia j- un esquema de los flujos de recaudación de impuestos, transferencias intergubernamentales y gastos públicos que impactan sobre la distribución regional y personal del ingreso.

Si bien se reconoce usualmente que puede existir complementariedad entre redistribución regional y personal, el hecho de que una transferencia mejore la distribución regional no implica que necesariamente también mejore la distribución personal. Y si mejora la distribución personal no implica que también lo haga con la regional. Para las transferencias entre países Bauer (1971), citado por Atkinson (1975), ha sugerido y presentado evidencia sobre la colisión entre los dos objetivos, resultando la posibilidad de que las familias pobres de los países ricos financien a las familias ricas de los países pobres. En la Argentina se ha sugerido esa probable colisión (Porto, 1990; Artana y López Murphy, 1995) aunque la evidencia presentada ha sido parcial. La importancia del tema exige una respuesta y ésta es necesariamente empírica. Las secciones siguientes de este trabajo presentan algunos resultados que, vale resaltar nuevamente, deben entenderse como preliminares.

Gráfico 1
Incidencia territorial y personal
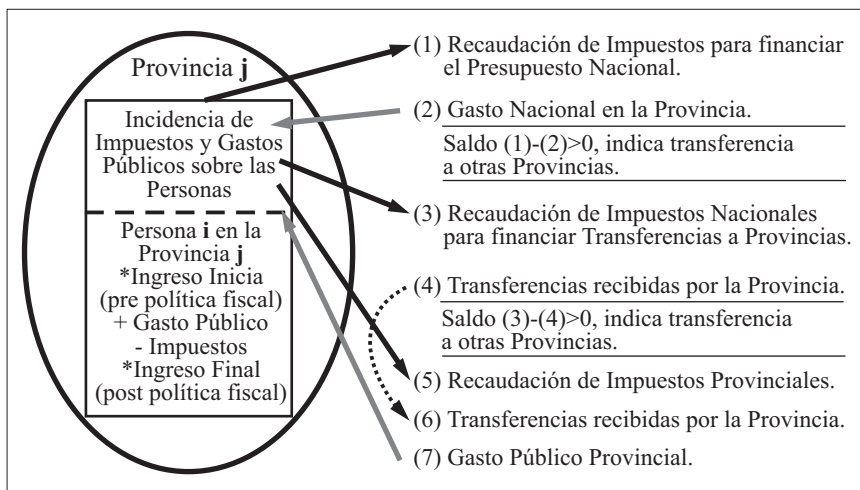
3. Información básica y cálculo del impacto de la política fiscal sobre la distribución del ingreso por provincias.

3.1. Algunos datos básicos.

La información básica (1991) sobre producto bruto interno, gasto público, recaudación propia y transferencias nacionales (por origen y destino) se presenta en el cuadro 1. Existe una gran variación entre provincias. Por ejemplo, la relación entre el PBI per cápita[5] más alto y el más bajo es 3,9, entre los gastos per cápita extremos la relación es 7,1 para los recursos propios es 6,6, y para las transferencias nacionales (por origen) es 3,4. El gasto provincial fluctúa entre un máximo de 59% del PBI provincial y un mínimo de 6,5%, siendo el promedio ponderado 10%; el tamaño es un primer indicador de capacidad potencial del gasto público provincial para modificar la distribución del ingreso dentro de la provincia. Las transferencias nacionales (recibidas) que financian ese gasto varían entre un máximo de 55% del PBI provincial y un mínimo de 2,8% con un promedio ponderado de 6,4%; el tamaño es, en este caso, un indicador de capacidad potencial de redistribución territorial de recursos.

3.2. Cálculo del impacto de la política fiscal sobre la distribución del ingreso[6]

Para estimar el impacto de la política fiscal sobre la distribución personal del ingreso, a nivel de cada provincia, se procedió del siguiente modo. Como punto de partida se cuantificó la distribución del ingreso para cada una de las provincias argentinas utilizando los relevamientos del INDEC para aglomerados urbanos (se calculó el promedio de las dos ondas del año 1991); cuando se contó con el dato para más de un aglomerado en una provincia, se ponderaron en base a la población de cada uno[7]. Se consideró como unidad a las personas (corrigiendo la distribución

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5. Hay serias dudas sobre las estimaciones tanto del PBI per cápita como de los ingresos promedio de las encuestas de hogares (calculados como el promedio simple de los ingresos de cada grupo encuestado). La correlación simple entre ambas variables es de 0,742; el resultado de una regresión lineal permite inferir una relación significativamente distinta de cero, aunque el coeficiente es significativamente distinto de uno -que sería el resultado esperable-.

6. El método seguido es similar al de Reynolds y Smolensky (1977) y Ahumada y otros (1996). Los supuestos y críticas más importantes pueden consultarse en esos trabajos. Las limitaciones más importantes –además de las informativas, especialmente relevantes en este caso- surgen de la definición del ingreso inicial, de los supuestos necesarios para calcular la incidencia de los gastos públicos y de los impuestos, de la identificación del valor (beneficio) para los consumidores con el gasto público efectivo, de la no consideración de diferenciales de eficiencia y de calidad, etcétera.

7. Para la provincia de Río negro no hay información disponible, por lo que se supuso igual distribución del ingreso y de la población de Chubut.

Política fiscal y distribución personal y regional del ingreso en la Argentina

Cuadro 1. Producto bruto interno, gasto público provincial y recursos fiscales por provincia (a). Año 1991.

Provincias	PBI $ per cápita	orden	Gasto total $ per cápita	orden	Gasto total % del PBI	orden	Recursos totales (orígen) $ per cápita	orden	Recursos totales (orígen) % del PBI	orden	Recursos propios $ per cápita	orden
1 Buenos Aires	4.978,03	11	322,79	23	6,48	23	509,93	9	10,24	11	182,58	12
2 Catamarca	3.807,71	15	1.009,33	6	26,51	3	310,03	21	8,14	18	104,83	16
3 Córdoba	5.154,41	10	456,14	20	8,85	20	570,44	8	11,07	8	212,16	9
4 Corrientes	3.327,01	18	542,61	17	16,31	12	299,64	22	9,01	15	88,86	18
5 Chaco	2.451,92	22	600,23	14	24,48	5	322,33	19	13,15	2	82,17	19
6 Chubut	8.594,97	5	834,88	9	9,71	18	678,90	5	7,90	19	244,16	6
7 Entre Ríos	3.806,19	16	557,70	16	14,65	14	472,87	10	12,42	4	162,70	14
8 Formosa	2.267,21	23	1.070,02	5	47,20	2	453,14	12	19,99	1	256,79	5
9 Jujuy	4.076,44	14	883,22	8	21,67	8	421,53	14	10,34	10	203,97	10
10 La Pampa	8.722,15	4	957,75	7	10,98	17	731,85	3	8,39	17	261,58	4
11 La Rioja	2.643,44	19	1.558,47	3	58,96	1	334,75	17	12,66	3	104,20	17
12 Mendoza	5.963,64	8	406,38	22	6,81	22	465,76	11	7,81	20	125,31	15
13 Misiones	2.570,01	20	466,65	18	18,16	10	315,19	20	12,26	5	77,51	20
14 Neuquén	2.929,57	1	1.317,82	4	14,76	13	688,23	4	7,71	21	343,10	3
15 Río Negro	6.342,14	7	766,99	11	12,09	16	585,26	6	9,23	14	234,21	7
16 Salta	4.411,79	13	638,01	13	14,46	15	443,61	13	10,06	13	224,68	8
17 San Juan	3.460,25	17	760,62	12	20,83	9	419,00	15	12,11	6	168,33	13
18 San Luis	5.387,57	9	799,42	10	14,84	12	378,65	16	7,03	22	69,82	23
19 Santa Cruz	8.926,54	2	1.971,98	2	22,09	7	937,59	2	10,50	9	457,96	1
20 Santa Fe	6.496,57	6	459,40	19	7,07	21	577,94	7	8,90	16	201,04	11
21 S. del Estero	2.504,91	21	597,63	15	23,86	6	255,95	23	10,22	12	75,30	21
22 T. del Fuego	8.926,54	3	2.78,83	1	25,53	4	1.025,18	1	11,48	7	404,79	2
23 Tucumán	4.686,58	12	443,65	21	9,47	19	323,40	18	6,90	23	75,03	22
Promed. ponderado	4.959,85		490,45		9,89		490,45		9,89		175,35	
Desvío estandar	2.322,27		403,58		12,59		202,44		2,82		107,29	
Máximo/mínimo	3,90		7,10				4,00				6,60	

Provincias	Recursos propios % del PBI	orden	Transf. nacionales (orígen) $ per cápita	orden	Transf. nacionales (orígen) % del PBI	orden	Transf. nacionales (destino) $ per cápita	orden	Transf. nacionales (destino) % del PBI	orden
1 Buenos Aires	3,67	12	327,36	10	6,58	10	140,21	23	2,82	23
2 Catamarca	2,75	19	205,20	21	5,39	17	904,50	5	23,75	3
3 Córdoba	4,12	8	358,27	6	6,95	8	243,97	22	4,73	20
4 Corrientes	2,67	20	210,77	20	6,34	11	453,75	15	13,64	11
5 Chaco	3,35	13	240,16	15	9,79	1	518,06	14	21,13	4
6 Chubut	2,84	18	434,74	4	5,06	21	590,72	10	6,87	19
7 Entre Ríos	4,27	7	310,16	11	8,15	5	395,00	17	10,38	14
8 Formosa	11,33	1	196,35	22	8,66	4	813,23	6	35,87	2
9 Jujuy	5,00	4	217,56	19	5,34	19	679,25	9	16,66	8
10 La Pampa	3,00	17	470,27	3	5,39	16	696,16	8	7,98	17
11 La Rioja	3,94	9	230,55	17	8,72	3	1.454,27	3	55,01	1
12 Mendoza	2,10	21	340,44	9	5,71	14	281,07	20	4,71	21
13 Misiones	3,02	15	237,67	16	9,25	2	389,14	18	15,14	10
14 Neuquén	3,84	10	345,13	8	3,87	23	974,71	4	10,92	13
15 Río Negro	3,69	11	351,05	7	5,54	15	532,78	12	8,40	16
16 Salta	5,09	3	218,93	18	4,96	22	413,32	16	9,37	15
17 San Juan	4,86	5	250,67	13	7,24	6	552,28	11	15,96	9
18 San Luis	1,30	23	308,83	12	5,73	13	729,60	7	13,54	12
19 Santa Cruz	5,13	2	479,63	2	5,37	18	1.514,02	2	16,96	7
20 Santa Fe	3,09	14	376,90	5	5,80	12	258,36	21	3,98	22
21 S. del Estero	3,01	16	180,66	23	7,21	7	522,33	13	20,85	6
22 T. del Fuego	4,53	6	620,39	1	6,95	9	1.874,04	1	20,99	5
23 Tucumán	1,60	22	248,37	14	5,30	20	368,62	19	7,87	18
Promed. ponderado	3,54		315,11		6,35		315,11		6,35	
Desvío estandar	1,95		110,44		1,55		435,68		11,66	
Máximo/mínimo	3,40						13,40			

(a) Los recursos totales por jurisdicción están compuestos por los recursos propios más el monto de los recursos que se recaudan en la jurisdicción para transferencias nacionales. El gasto en cada provincia se iguala a los recursos propios más las transferencias recibidas en la provincia.

Fuente: Dirección Nacional de Coordinación Fiscal con las Provincias: Base de Datos de la Secretaría de Asistencia para la Reforma Económica Provincial (SAREP).

del ingreso de deciles de familias a quintiles de personas). Para analizar el impacto de la política fiscal sobre la distribución del ingreso se partió de los gastos provinciales clasificados por finalidad[8]. Estos gastos fueron distribuidos por quintiles utilizando la estimación realizada por Porto y Gasparini (1994) para la provincia de Buenos Aires, corrigiendo la asignación de familias a personas. Los recursos provinciales propios se distribuyeron utilizando una estimación disponible para la provincia de Buenos Aires (Convenio FCE. UNLP-MEPBA. Nº 9). (Una discusión más detallada se presenta en el Anexo).

Por último, las transferencias nacionales se calcularon como lo aportado por cada provincia a los fondos nacionales (origen) que luego son distribuidos (destino) a las provincias según los distintos regímenes (coparticipación y otros), la estimación se efectuó de modo que a nivel del conjunto de provincias el ingreso medio no se modifica[9], siendo el ingreso medio de las provincias favorecidas mayor que el inicial, y viceversa en las perjudicadas.

Los resultados del ejercicio se presentan en los cuadros 2 y 3. En el cuadro 4 se calcula la variación en el ingreso per cápita de cada quintil debida a la política fiscal provincial y a los regímenes de transferencias nacionales. El ingreso per cápita de los tres quintiles más pobres aumenta en todas las provincias, el ingreso del cuarto quintil disminuye en Buenos Aires, Córdoba, Mendoza y Santa Fe. El ingreso del quintil más rico disminuye en la mayoría de las provincias. Surge también del cuadro 4 que el aumento en el ingreso de los quintiles más pobres es menor, en tanto que la disminución en el ingreso de los quintiles más ricos es mayor, en las provincias que "financian" al resto (Buenos Aires, Córdoba, Mendoza y Santa Fe).

La estimación econométrica de la relación entre variación en el ingreso (Y) y el ingreso per cápita inicial (Y) de cada quintil en cada provincia dio como resultado (el estadístico "t" entre paréntesis).[10]

$$\Delta Y = 670,45 - 0,061 \ Y$$
$$(10,45) \ (-6,71)$$
$$R^2 \text{ ajustado} = 0,28$$

El signo del coeficiente es negativo y significativo, sugiriendo que los grupos de mayor ingreso, en promedio, financian a los de menor ingreso.

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8. La información básica se obtuvo de la Dirección Nacional de Coordinación Fiscal con las provincias.
9. Para cada provincia, la diferencia entre total de gasto y total de recursos se incorporó como recursos propios, dado que esa diferencia (endeudamiento) se supone que se convertirá en futuros impuestos provinciales.
10. Un signo negativo (positivo) implica que los grupos de mayor ingreso aportan (reciben) recursos.

Cuadro 2. Distribución porcentual del ingreso por quintiles previo y posterior a la acción fiscal.

Provincias	Quintil 1		Quintil 2		Quintil 3		Quintil 4		Quintil 5	
	Antes	Después	Antes	Después	Antes	Después	Antes	Después	Antes	Después
1 Buenos Aires	5,54	6,70	8,95	9,81	13,85	14,40	21,50	21,42	50,15	47,67
2 Catamarca	5,80	8,77	9,65	11,31	14,54	15,55	21,95	21,59	48,06	42,78
3 Córdoba	6,30	7,71	9,82	10,81	14,95	15,60	23,00	22,91	45,94	42,97
4 Corrientes	5,76	7,92	9,22	10,64	14,42	15,29	22,79	22,59	47,81	43,55
5 Chaco	5,39	8,70	8,55	10,70	13,30	14,61	20,93	20,83	51,83	45,16
6 Chubut	5,51	7,11	9,78	10,65	14,47	14,96	21,70	21,46	48,64	45,82
7 Entre Ríos	6,07	8,23	9,69	11,15	14,68	15,62	22,47	22,28	47,08	42,71
8 Formosa	5,54	10,87	9,29	12,15	14,17	15,71	22,33	21,52	48,67	39,75
9 Jujuy	5,75	8,06	8,71	10,26	13,43	14,37	21,28	21,18	50,84	46,13
10 La Pampa	6,91	8,52	10,43	11,50	15,30	15,99	22,78	22,64	44,58	41,35
11 La Rioja	5,60	9,96	8,96	11,67	13,95	15,58	22,12	21,72	49,36	41,07
12 Mendoza	6,51	7,68	10,15	10,91	14,88	15,36	22,89	22,77	45,58	43,26
13 Misiones	5,44	7,95	9,00	10,69	14,44	15,52	22,41	22,23	48,71	43,61
14 Neuquén	5,20	7,18	8,64	9,90	13,65	14,40	22,26	22,02	50,25	46,50
15 Río Negro	5,51	7,57	9,78	10,90	14,47	15,16	21,70	21,43	48,54	44,94
16 Salta	5,87	7,67	9,59	10,65	14,32	15,17	22,10	21,89	48,12	44,86
17 San Juan	6,29	9,02	9,82	11,62	14,84	15,95	22,39	22,11	46,66	41,30
18 San Luis	6,74	8,41	10,21	11,32	14,72	15,50	21,73	21,68	46,60	43,09
19 Santa Cruz	6,24	8,97	10,20	11,66	15,10	15,86	22,42	21,96	46,04	41,55
20 Santa Fe	6,11	7,28	9,79	10,61	14,55	15,10	22,49	22,38	47,06	44,63
21 S. del Estero	5,62	8,55	9,25	10,92	14,06	15,11	22,35	22,21	48,72	43,22
22 T. del Fuego	5,75	9,03	10,11	11,80	15,22	16,11	22,30	21,88	46,62	41,18
23 Tucumán	5,39	6,84	9,71	10,52	14,66	15,18	22,09	21,89	48,14	45,57

Nota: Las ondas se presentan por deciles de familias y se ajustan a quintiles de personas. Luego se hace un promedio simple de cada onda.

Fuente: Encuesta Permanente de Hogares (EPH), ondas de mayo y octubre (1991).

3. 3. Índices de desigualdad antes y después de la política fiscal.

Para contar con una medida resumen del impacto de la acción presupuestaria de los gobiernos provinciales sobre la distribución del ingreso se calcularon los índices de desigualdad de Gini y Atkinson[11], antes y después de la política fiscal.

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11. El coeficiente de desigualdad de Gini se define como $GI = \dfrac{\sum\limits_{i=1}^{n} \sum\limits_{j=1}^{n} p_i \, p_j \left| Y_i - Y_j \right|}{2 \, \overline{Y}}$, donde

p_i (p_j) es la población del grupo de ingresos i (j) con ingresos Y_i (Y_j), e Y es el ingreso promedio. Cuando los grupos son de igual tamaño ($p_i = p_j = 1/n$, donde n es la cantidad de grupos de ingreso),

el Gini es igual a: $GI = \dfrac{\sum\limits_{i=1}^{n} \sum\limits_{j=1}^{n} \left| Y_i - Y_j \right|}{2 \, n^2 \, \overline{Y}} = 1 + \dfrac{1}{n} - \dfrac{2 \sum\limits_{i=1}^{n} i \, Y_j}{n^2 \, \overline{Y}}$

El coeficiente de Gini se calcula como el coeficiente entre dos áreas: la formada por la diferencia entre la líneas de perfecta igualdad y la curva de Lorenz de concentración de ingresos, y el área triangular debajo de la línea de perfecta igualdad.

Cuadro 3. Ingreso per cápita por quintiles previo y posterior a la acción fiscal, 1991 (en pesos).

Provincias	Quintil 1		Quintil 2		Quintil 3	
	Antes	Después	Antes	Después	Antes	Después
1 Buenos Aires	1.379,7	1.604,6	2.228,8	2.348,8	3.447,5	3.448,8
2 Catamarca	1.105,0	1.975,8	1.837,5	2.548,9	2.767,6	3.504,3
3 Córdoba	1.622,7	1.943,6	2.529,9	2.724,7	3.852,4	3.930,5
4 Corrientes	957,6	1.413,7	1.534,3	1.899,3	2.399,8	2.730,0
5 Chaco	661,2	1.187,8	1.047,8	1.460,0	1.630,4	1.994,3
6 Chubut	2.369,8	3.110,1	4.203,6	4.658,6	6.216,4	6.547,0
7 Entre Ríos	1.154,7	1.601,5	1.844,5	2.170,1	2.794,4	3.039,8
8 Formosa	627,8	1.567,0	1.053,4	1.752,6	1.606,3	2.264,8
9 Jujuy	1.171,1	1.829,9	1.775,3	2.327,2	2.736,6	3.260,6
10 La Pampa	3.015,5	3.812,1	4.550,1	5.146,6	6.671,1	7.155,5
11 La Rioja	740,2	1.926,3	1.184,8	2.255,8	1.843,8	3.012,5
12 Mendoza	1.941,1	2.268,3	3.026,7	3.220,1	4.436,4	4.540,0
13 Misiones	699,2	1.082,4	1.156,4	1.454,3	1.855,4	2.111,5
14 Neuquén	2.322,3	3.429,4	3.858,4	4.734,0	6.092,5	6.882,9
15 Río Negro	1.748,7	2.469,3	3.101,8	3.555,0	4.587,0	4.945,6
16 Salta	1.294,6	1.766,1	2.114,4	2.453,0	3.158,8	3.439,1
17 San Juan	1.087,9	1.697,0	1.698,9	2.185,4	2.568,2	3.000,3
18 San Luis	1.815,8	2.443,2	2.749,3	3.227,0	3.965,8	4.502,9
19 Santa Cruz	2.785,1	4.466,1	4.551,8	5.804,8	6.738,5	7.900,5
20 Santa Fe	1.985,7	2.322,2	3.181,1	3.381,9	4.724,7	4.812,6
21 S. del Estero	703,3	1.216,3	1.158,6	1.554,3	1.761,5	2.150,5
22 T. del Fuego	2.565,9	4.595,8	4.513,8	6.004,3	6.792,2	8.200,3
23 Tucumán	1.264,0	1.643,2	2.275,9	2.527,8	3.435,0	3.648,5

Provincias	Quintil 4		Quintil 5		Total			
	Antes	Después	Antes	Después	Antes	Orden	Después	Orden
1 Buenos Aires	53520	5.132,1	12.482,2	11.420,1	4.978,0	11	4.790,9	12
2 Catamarca	41791	4.864,9	9.149,4	9.641,2	3.807,7	15	4.507,0	15
3 Córdoba	59280	5.772,7	11.839,1	10.829,0	5.154,4	10	5.040,1	10
4 Corrientes	37907	4.033,0	7.952,9	7.773,8	3.327,0	18	3.570,0	19
5 Chaco	25661	2.843,5	6.354,0	6.163,5	2.451,9	22	2.729,8	22
6 Chubut	93241	9.391,1	20.860,9	20.047,9	8.595,0	5	8.750,9	5
7 Entre Ríos	42767	4.335,0	8.960,7	8.308,7	3.806,2	16	3.891,0	16
8 Formosa	25318	3.103,9	5.516,8	5.732,2	2.267,2	23	2.884,1	20
9 Jujuy	43370	4.805,7	10.362,3	10.467,3	4.076,4	14	4.538,1	14
10 La Pampa	99338	10.127,9	19.440,3	18.498,0	8.722,1	4	8.948,0	4
11 La Rioja	29239	4.200,3	6.524,6	7.940,8	2.643,4	19	3.867,2	17
12 Mendoza	68244	6.722,6	13.589,7	12.770,3	5.963,6	8	5.904,3	8
13 Misiones	28803	3.024,7	6.258,8	5.934,5	2.570,0	20	2.721,5	23
14 Neuquén	99401	10.524,7	22.434,5	22.224,6	8.929,6	1	9.559,1	3
15 Río Negro	68802	6.990,6	15.393,1	14.658,8	6.342,1	7	6.523,9	6
16 Salta	48757	5.040,4	10.615,5	10.332,2	4.411,8	13	4.606,2	13
17 San Juan	38732	4.157,9	8.073,1	7.768,7	3.460,2	17	3.761,9	18
18 San Luis	58533	6.295,6	12.553,6	12.512,9	5.387,6	9	5.808,3	9
19 Santa Cruz	100067	10.937,1	20.550,7	20.655,9	8.926,5	2	9.960,9	2
20 Santa Fe	73047	7.138,0	15.286,5	14.232,4	6.496,6	6	6.378,2	7
21 S. del Estero	27988	3.160,4	6.102,4	6.151,4	2.504,9	21	2.846,6	21
22 T. del Fuego	99533	11.138,3	20.807,5	20.962,0	8.926,5	3	10.180,1	1
23 Tucumán	51773	5.261,9	11.280,8	10.952,7	4.686,6	12	4.806,8	11

Nota: Las ondas se presentan por deciles de familias y se ajustan a quintiles de personas. Luego se hace un promedio simple de cada onda.

Fuente: Encuesta Permanente de Hogares (EPH), ondas de mayo y octubre (1991).

Cuadro 4. Variación en el ingreso per cápita de cada quintil, 1991 (en pesos).

Provincias	Quintil 1	Orden	Quintil 2	Orden	Quintil 3	Orden	Quintil 4	Orden	Quintil 5	Orden	Total	Orden
1 Buenos Aires	224,95	23	120,00	23	1,28	23	-219,85	23	-1.062,13	23	-187,15	23
2 Catamarca	870,80	6	711,39	5	736,67	5	685,83	4	491,80	2	699,30	4
3 Córdoba	320,95	22	194,84	21	78,05	22	-155,29	21	1.010,10	21	-114,31	21
4 Corrientes	456,14	16	365,05	15	330,41	15	242,25	12	-179,01	9	242,97	12
5 Chaco	526,59	13	412,17	13	363,86	12	277,37	11	-190,52	10	277,89	11
6 Chubut	740,32	8	455,05	10	330,58	14	66,94	18	-813,05	18	155,96	16
7 Entre Ríos	446,84	17	325,62	17	245,41	18	58,27	19	-652,00	16	84,83	19
8 Formosa	939,16	5	699,25	6	658,53	6	571,94	6	215,41	3	616,86	6
9 Jujuy	658,83	10	551,87	8	524,05	8	468,70	7	104,94	6	461,68	7
10 La Pampa	796,65	7	596,52	7	484,36	9	194,13	13	-942,25	21	225,88	13
11 La Rioja	1.186,12	3	1.071,07	3	1.168,76	2	1.276,40	1	1.416,24	1	1.223,72	2
12 Mendoza	327,23	21	193,35	22	103,59	20	-101,78	20	-819,33	19	-59,39	20
13 Misiones	383,20	18	297,95	18	256,11	17	144,36	15	-324,31	14	151,46	17
14 Neuquén	1.107,09	4	875,55	4	790,38	4	584,62	5	-209,84	11	629,56	5
15 Río Negro	720,69	9	453,18	12	338,51	13	110,42	16	-734,23	17	181,71	15
16 Salta	471,54	15	338,62	16	280,30	16	164,72	14	-283,28	12	194,38	14
17 San Juan	609,11	12	486,48	11	432,11	10	284,73	10	-304,40	13	301,61	10
18 San Luis	627,44	11	537,71	9	537,14	7	442,32	8	-40,76	8	420,77	8
19 Santa Cruz	1.681,07	2	1.253,02	2	1.162,07	3	930,44	3	145,19	5	1.034,36	3
20 Santa Fe	336,49	20	203,74	20	87,90	21	-166,73	22	-1.054,14	22	-118,55	22
21 S. del Estero	512,98	14	395,67	14	389,03	11	361,64	9	49,04	7	341,67	9
22 T. del Fuego	2.029,82	1	1490,58	1	1.408,19	1	1.184,97	2	154,48	4	1.253,61	1
23 Tucumán	379,22	19	251,97	19	213,51	19	84,57	17	-328,05	15	120,24	18

Fuente: Realizado en base al Cuadro 3.

En el cuadro 5 se observa que el presupuesto provincial (gastos y su financiamiento) mejora la distribución del ingreso en todas las provincias. Las provincias con mayor impacto positivo sobre el Gini son Formosa, La Rioja, Chaco y Tierra del Fuego; y las provincias con menor impacto son Tucumán, Bs. Aires, Santa Fe y Mendoza.

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El índice de desigualdad de Atkinson es $D(A) = 1 - \dfrac{Y^*}{\overline{Y}}$, donde $Y^* = (\sum_{i=1}^{n} Y_i\alpha / n)^{1/\alpha}$

siendo el coeficiente que resume un juicio de valor que indica el grado de aversión a la desigualdad (cuanto menor es el valor de α, mayor es la ponderación que se da a los quintiles más pobres), e Y^* el ingreso idénticamente distribuido (o sea, para cada juicio de valor, si se realiza una redistribución de ingresos entre individual de modo que a cada uno le corresponda un ingreso de Y^*, el bienestar permanece inalterado respecto de la distribución inicial).

Cuadro 5. Índices de desigualdad antes y después de la acción fiscal.
Gasto público provincial. Año 1991.

Provincias	Gini				Atkinson ($\alpha = 0,5$)			
	Pre acción fiscal	Orden	Post acción fiscal	Orden	Pre acción fiscal	Orden	Post acción fiscal	Orden
1 Buenos Aires	0,407	20	0,374	23	0,136	20	0114	23
2 Catamarca	0,387	10	0,313	7	0,123	10	0079	7
3 Córdoba	0,370	5	0,330	11	0,111	5	0088	11
4 Corrientes	0,391	12	0,333	15	0,125	12	0089	14
5 Chaco	0,421	23	0,332	14	0,146	23	0090	15
6 Chubut	0,392	14	0,353	20	0,126	14	0101	20
7 Entre Ríos	0,379	9	0,320	9	0,117	9	0083	9
8 Formosa	0,397	16	0,269	1	0,129	17	0059	1
9 Jujuy	0,411	21	0,348	19	0,138	21	0099	19
10 La Pampa	0,351	1	0,307	6	0,099	1	0076	6
11 La Rioja	0,403	19	0,289	2	0,133	19	0068	2
12 Mendoza	0,363	2	0,332	13	0,107	2	0089	13
13 Misiones	0,400	18	0,331	12	0,131	18	0089	12
14 Neuquén	0,415	22	0,363	22	0,141	22	0107	22
15 Río Negro	0,392	15	0,341	16	0,126	15	0094	16
16 Salta	0,388	11	0,342	17	0,123	11	0095	17
17 San Juan	0,373	6	0,300	4	0,113	6	0073	4
18 San Luis	0,365	3	0,319	8	0,108	3	0082	8
19 Santa Cruz	0,367	4	0,302	5	0,110	4	0073	5
20 Santa Fe	0,378	8	0,346	18	0,116	8	0097	18
21 S. del Estero	0,397	17	0,323	10	0,129	16	0084	10
22 T. del Fuego	0,376	7	0,298	3	0,116	7	0071	3
23 Tucumán	0,391	13	0,366	21	0,126	13	0102	21

Provincias	Atkinson ($\alpha = -1$)				Atkinson ($\alpha = -10$)			
	Pre acción fiscal	Orden	Post acción fiscal	Orden	Pre acción fiscal	Orden	Post acción fiscal	Orden
1 Buenos Aires	0,420	21	0,356	23	0,675	16	0,607	23
2 Catamarca	0,392	11	0,257	7	0,659	10	0,489	5
3 Córdoba	0,364	5	0,292	14	0,631	4	0,549	15
4 Corrientes	0,399	12	0,291	13	0,662	11	0,537	14
5 Chaco	0,438	22	0,280	11	0,684	22	0,495	7
6 Chubut	0,404	14	0,324	20	0,676	18	0,583	21
7 Entre Ríos	0,378	8	0,272	10	0,644	8	0,519	11
8 Formosa	0,410	17	0,192	1	0,675	17	0,381	1
9 Jujuy	0,419	20	0,306	18	0,663	3	0,531	12
10 La Pampa	0,328	1	0,254	6	0,595	1	0,502	8
11 La Rioja	0,415	18	0,220	2	0,671	15	0,426	2
12 Mendoza	0,351	3	0,294	15	0,618	3	0,550	16
13 Misiones	0,418	19	0,289	12	0,681	20	0,535	13
14 Neuquén	0,440	23	0,336	22	0,695	23	0,580	20
15 Río Negro	0,404	13	0,303	16	0,676	19	0,557	18
16 Salta	0,391	10	0,304	17	0,656	9	0,551	17
17 San Juan	0,366	6	0,240	4	0,631	5	0,474	4
18 San Luis	0,345	2	0,267	8	0,605	2	0,508	10
19 Santa Cruz	0,360	4	0,242	5	0,634	6	0,477	5
20 Santa Fe	0,375	7	0,315	19	0,641	7	0,573	19
21 S. del Estero	0,408	15	0,271	9	0,670	14	0,502	9
22 T. del Fuego	0,382	9	0,237	3	0,662	12	0,473	3
23 Tucumán	0,408	16	0,333	21	0,683	21	0,599	22

Las fórmulas de los coeficientes son las siguientes: $GL = (1 + \frac{1}{n}) - \frac{2}{n^2 Y^p} \sum_{i=1}^{n} i\, Y_i$ donde Y_i es el ingreso de cada quintil e Y^p es el ingreso promedio antes o después de la acción fiscal según sea el GL que se mida. El término n es el tamaño de la población (grupo de ingreso). $D = 1 - (Y^* / Y^p)$ donde D es el índice de desigualdad de Atkinson, Y^p es el ingreso promedio de cada jurisdicción $e\ Y^* = \left(\sum_i (Y_i\, \alpha / n) \right)^{\frac{1}{\alpha}}$ es el ingreso idénticamente distribuido. El parámetro indica el grado de aversión a la desigualdad (a menor α, mayor ponderación al grupo de ingresos más pobre).

Fuente: Elaborado en base al cuadro 3.

El impacto distributivo de la política fiscal se estima usualmente como el índice de Reynolds-Smolensky (RS_p)[12], definido como la diferencia absoluta de los coeficientes de Gini, antes y después del presupuesto; o sea,

$$RS_p = GL_d \text{ - } GL_a$$

Esta metodología se aplica cuando no se produce reordenamiento de los grupos de ingreso por la acción fiscal. Un signo negativo (positivo) implica un mejoramiento (empeoramiento) en la distribución personal del ingreso[13], Por ejemplo, si luego de la política fiscal, la curva de Lorenz de distribución del ingreso está por encima de la curva de Lorenz previa a la política fiscal, mejora la distribución del ingreso.

En el gráfico 2. CL_a es la curva de Lorenz antes de la acción fiscal (el coeficiente de Gini es igual a $(A+B)/(A+B+C)$) y CL_d es la curva posterior a la acción fiscal (donde $GL_d = A/(A+B+C)$). En ese caso, mejora la distribución del ingreso; entonces $RS_p = \text{-}B/(A+B+C)$.

Gráfico 2

El impacto distributivo — % Y — CLd — CLa — A — B — C — % Población

_____
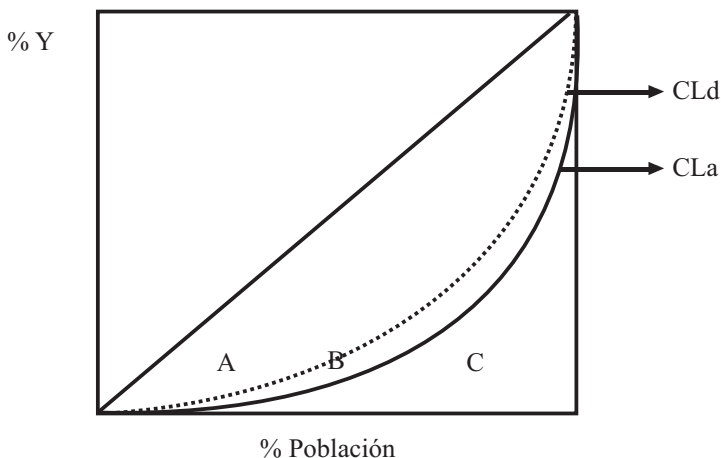
12. Para detalles ver Ahumada y otros (1996).

13. Mejoramiento (empeoramiento) significa que la desigualdad en la distribución personal del ingreso disminuye (aumenta).

El cálculo del RS_p para las provincias se presenta en la última columna del cuadro 6 [14].

El RS_p se puede descomponer en distintos efectos que son, por un lado, la progresividad y, por otro lado, el tamaño de gastos e impuestos. El primer determinante se mide usualmente de la forma propuesta por Kakwani (1977),

$$K_g = GL_a - C_g$$
$$K_t = G_t - GL_a$$

Donde K_g es el coeficiente de progresividad del gasto público (definido como la diferencia entre Gini inicial y el índice de concentración del gasto (C_g)) y K_j es el coeficiente de progresividad de los impuestos (definido como la diferencia entre el índice de concentración de los impuestos (C_t) y el Gini inicial) [15].

Un presupuesto de gastos progresivos resulta si C_g está por encima de CL_a (gráfico 3). Entonces, $GL_a = (D+E)/(D+E+F)$, $C_g = D/(D+E+F)$ y $K_g = E/(D+E+F)$.

Gráfico 3

% Poblacion

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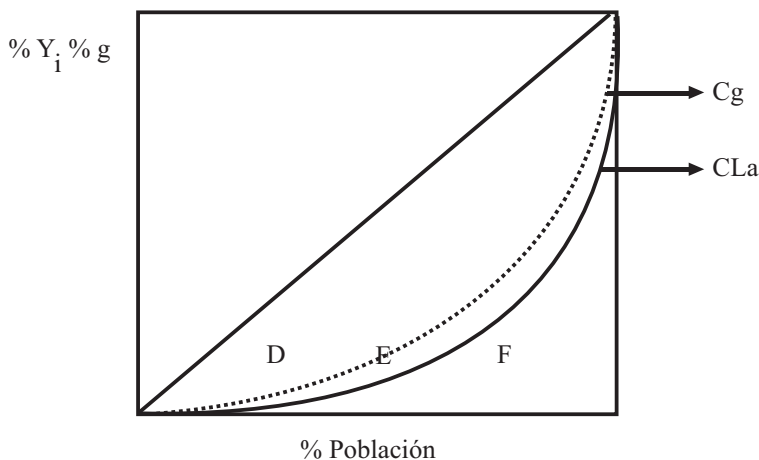
14. Es la diferencia de los coeficientes Gini en el cuadro 5.

15. El índice de concentración de gasto (impuestos) se calcula como el coeficiente entre dos áreas: la formada por la diferencia entre la línea de perfecta igualdad y la curva de concentración del gasto (impuesto), y el área triangular debajo de la línea de perfecta igualdad. La curva de concentración del gasto (impuestos) indica la proporción total del gasto (impuestos) que recibe (paga) la población con un ingreso menor o igual que "x". Ver gráficos 3 y 4.

CUADRO 6. Coeficientes de Reynolds-Smolensky (RSp), y de Kakwani para gastos (Kg) y recursos (Kt).

Provincias	Kg	Orden	g/(1-t+g)	Orden	Kt	Orden	t/(1-t+g)	Orden	RSp	Orden
1 Buenos Aires	0,375	4	0,067	23	0,071	12	0,106	7	-0,033	21
2 Catamarca	0,307	16	0,224	3	0,077	10	0,069	21	-0,074	6
3 Córdoba	0,306	18	0,091	20	0,104	4	0,113	5	-0,039	18
4 Corrientes	0,335	9	0,152	11	0,081	8	0,084	16	-0,058	12
5 Chaco	0,383	2	0,220	5	0,039	20	0,118	3	-0,089	3
6 Chubut	0,379	3	0,095	18	0,036	22	0,078	19	-0,039	19
7 Entre Ríos	0,317	15	0,143	12	0,111	3	0,122	2	-0,059	11
8 Formosa	0,331	11	0,371	2	0,038	21	0,157	1	-0,129	1
9 Jujuy	0,296	20	0,195	8	0,056	16	0,093	11	-0,063	10
10 La Pampa	0,302	19	0,107	17	0,137	1	0,082	17	-0,044	17
11 La Rioja	0,268	23	0,403	1	0,068	13	0,087	15	-0,114	2
12 Mendoza	0,340	8	0,069	22	0,101	5	0,079	18	-0,031	23
13 Misiones	0,350	6	0,171	10	0,072	11	0,116	4	-0,068	8
14 Neuquén	0,357	5	0,138	14	0,036	23	0,072	20	-0,052	13
15 Río Negro	0,395	1	0,118	16	0,049	18	0,090	14	-0,051	14
16 Salta	0,296	21	0,139	13	0,048	19	0,096	9	-0,046	16
17 San Juan	0,327	12	0,192	9	0,094	7	0,111	6	-0,073	7
18 San Luis	0,281	22	0,138	15	0,115	2	0,065	23	-0,046	15
19 Santa Cruz	0,307	17	0,198	7	0,050	17	0,094	10	-0,065	9
20 Santa Fe	0,333	10	0,072	21	0,094	6	0,091	12	-0,032	22
21 S. del Estero	0,322	14	0,210	6	0,078	9	0,090	13	-0,075	5
22 T. del Fuego	0,324	13	0,224	4	0,056	15	0,101	8	-0,078	4
23 Tucumán	0,348	7	0,092	19	0,059	14	0,067	22	-0,036	20

<u>Nota</u>: Los coeficientes se calculan de la siguiente forma:

$Kg = GL_a - C_g$

$Kt = C_t - GL_a$

$RSp = K_g \times g / (1 - t + g) + K_t \times t / (1 - t + g)$

Fuente: Elaborado en base al cuadro 3.

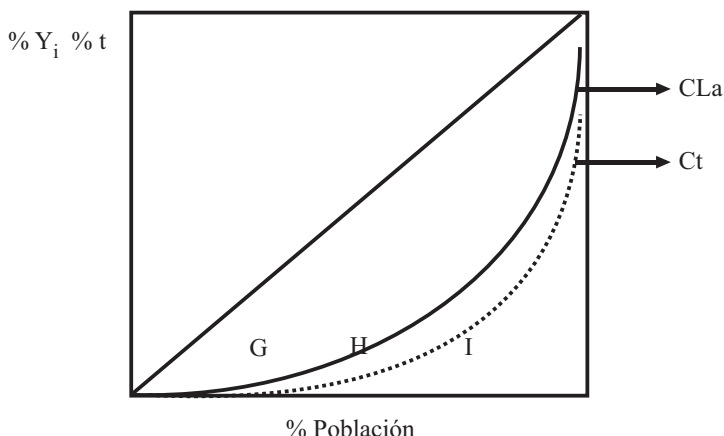El sistema tributario es progresivo si CL_a está por encima de C_t (gráfico 4). En este caso, $GL_a = G/(G+H+L)$, $C_t = (G+H)/(G+H+L)$ y $K_t = H/(G+H+L)$.

Gráfico 4

Desagregados por determinantes, el indicador de Reynolds-Smolensky queda expresado de la siguiente forma:

$$RS_p = - \left[\left(\frac{t}{1 - t + g} \right) Kt + \left(\frac{g}{1 - t + g} \right) Kg \right]$$

Donde t es el tamaño relativo de los impuestos (presión tributaria sobre el PBI) y g el tamaño del gasto (gasto en términos del PBI).

Los cálculos se presentan en el cuadro 6. Para todas las provincias resulta que tanto los gastos como los impuestos son progresivos (K_g y K_t son positivos en todos los casos). El cuadro permite analizar la importancia relativa, a nivel de cada provincia, de los determinantes del cambio en la distribución del ingreso. Por ejemplo, La Rioja tiene el mayor tamaño del gasto y se ubica en el último lugar del orden según progresividad; Chubut y Buenos Aires muestran la relación inversa, con alta progresividad del gasto (3 y 4) y bajo tamaño (18 y 23, respectivamente); San Juan y Corrientes son ejemplos de situaciones intermedias para las dos medidas (orden 12 y 9 para progresividad del gasto, y 9 y 11 para el tamaño).

3. 4. Medidas de concentración del gasto.[16]

Si el interés de la investigación es la medición del impacto del gasto público sobre la igualdad, se utiliza como medida resumen el coeficiente de Kakwani para el gasto (K_g, definido anteriormente). En cambio, si el interés se centra en la focalización del gasto (por ejemplo, un programa de vivienda orientado a los individuos cuyos ingresos están por debajo de la línea de pobreza), se considera más adecuado utilizar el coeficiente de concentración del gasto (G_g, definido anteriormente) (ver Milanovic, 1995).

El gráfico 5 se presenta dos curvas de concentración de gasto; en este caso, C_{g_1} indica mayor focalización del gasto (si los beneficios del gasto son apropiados por el individuo más pobre, el coeficiente C_g tomará valor -1) que C_{g_2} (si los beneficios son apropiados por el individuo más rico, C_g tomará valor 1). En el cuadro 7 se presenta un cálculo (muy preliminar) de los índices de concentración del gasto por finalidades por provincias. Debido al método utilizado para la distribución personal de gastos en las provincias (que surge de la información de distribución familiar en Buenos Aires y de los datos fiscales de cada provincia), el valor resultante del coeficiente en cada finalidad es una aproximación muy tentativa. Para el gasto total, en todos los casos el valor se acerca al de una distribución igualitaria. Los mayores valores se observan en Jujuy y La Rioja, implicando un sesgo hacia los gru-

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16. El índice de concentración del gasto se calculó debido a su relevancia para el diseño y evaluación de políticas de gasto público según distintos objetivos ("impacto distributivo" vs. "focalización"). En su comentario Carciofi enfatiza la importancia del índice de concentración de impuestos que no se incorpora en el trabajo, pero puede consultarse en Porto y Cont (1996).

pos más ricos. Educación es el gasto con mayor concentración seguido, como es usual encontrar en estudios empíricos para otros países, por Salud (Milanovic, 1995).

Con mejor información sobre la distribución de gastos entre quintil es por provincias, se obtendrían ganancias en dos sentidos: por un lado mejoraría la estimación del impacto distributivo del gasto; por otro lado, se contaría con una medida más precisa de los resultados de los programas focalizados.

Gráfico 5
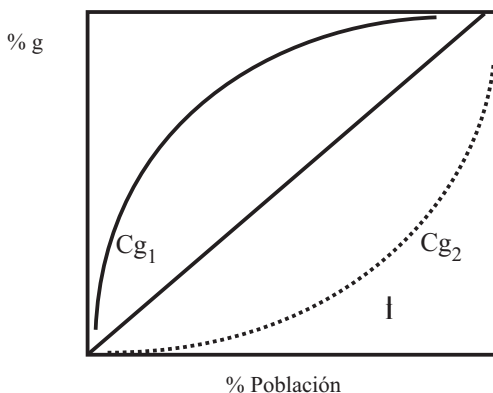
Cuadro 7. Coeficientes de concentración del gasto público provincial.

Provincias	Gasto total	Administración General	Seguridad	Salud	Cultura y Educación	Servicios Económicos	Bienestar Social
1 Buenos Aires	0,032	0,125	0,203	-0,113	-0,137	0,243	0,036
2 Catamarca	0,080	0,122	0,201	-0,117	-0,141	0,242	0,034
3 Córdoba	0,064	0,133	0,211	-0,103	-0,128	0,251	0,045
4 Corrientes	0,055	0,138	0,216	-0,098	-0,123	0,256	0,051
5 Chaco	0,038	0,136	0,213	-0,100	-0,126	0,254	0,049
6 Chubut	0,013	0,107	0,186	-0,136	-0,160	0,227	0,016
7 Entre Ríos	0,052	0,133	0,211	-0,103	-0,128	0,251	0,048
8 Formosa	0,067	0,135	0,214	-0,102	-0,128	0,255	0,048
9 Jujuy	0,115	0,150	0,228	-0,084	-0,111	0,268	0,064
10 La Pampa	0,049	0,135	0,213	-0,101	-0,126	0,253	0,048
11 La Rioja	0,135	0,144	0,221	-0,090	-0,116	0,262	0,058
12 Mendoza	0,023	0,115	0,194	-0,125	-0,148	0,234	0,026
13 Misiones	0,050	0,138	0,216	-0,097	-0,122	0,257	0,051
14 Neuquén	0,058	0,138	0,215	-0,097	-0,121	0,256	0,052
15 Río Negro	0,003	0,107	0,186	-0,136	-0,160	0,227	0,016
16 Salta	0,092	0,132	0,210	-0,108	-0,131	0,251	0,044
17 San Juan	0,046	0,127	0,205	-0,110	-0,135	0,246	0,039
18 San Luis	0,084	0,139	0,217	-0,097	-0,123	0,257	0,052
19 Santa Cruz	0,061	0,118	0,197	-0,122	-0,147	0,238	0,028
20 Santa Fe	0,046	0,126	0,206	-0,109	-0,132	0,246	0,041
21 S. del Estero	0,075	0,134	0,212	-0,103	-0,128	0,253	0,047
22 T. del Fuego	0,052	0,123	0,203	-0,117	-0,144	0,244	0,034
23 Tucumán	0,043	0,097	0,176	-0,146	-0,169	0,217	0,006
Total país	**0,051**	**0,128**	**0,206**	**-0,110**	**-0,134**	**-0,248**	**-0,039**

Fuente: elaboración propia.

4. Estimación del impacto distributivo para el conjunto de provincias.

En el cuadro 8 se calcula el ingreso per cápita de cada quintil de personas, antes y después de la política fiscal; se sumaron los ingresos de los primeros quintiles de cada provincia, luego los segundos, y así sucesivamente. En el cuadro 9 se calculan los coeficientes de desigualdad, progresividad, tamaño y el de Reynolds-Smolensky, para el conjunto de provincias. Los presupuestos provinciales en su conjunto son progresivos ($K_g > 0$), así como también su financiamiento ($K_t > 0$). El impacto sobre la distribución del ingreso es positivo ($RS_p < 0$). Por ejemplo, el índice de desigualdad de Gini disminuye de 0,392 a 0,351.

Cuadro 8. Distribución del ingreso per cápita por quintiles antes y después de la acción fiscal (a).

Total país	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5	Total
Distribución del ingreso por quintiles (en%)						
Antes de la acción fiscal	5,81	9,37	14,26	22,03	48,53	100
Después de la acción fiscal	7,34	10,40	14,91	21,90	45,45	100
Ingreso per cápita por quintiles (en pesos)						
Antes de la acción fiscal	1.439,9	2.324,2	3.537,1	5.462,8	12.035,4	4.959,9
Después de la acción fiscal	1.819,5	2.578,2	3.698,1	5.431,4	11.271,9	4.959,8

(a) se excluye a Capital Federal.   **Fuente:** Elaboración en base al cuadro 3.

Cuadro 9. Coeficientes de desigualdad, progresividad y redistribución del ingreso (a). Agregado provincial. Año 1991.

	Antes	Después
Índices de desigualdad , Gini y Atkinson		
Gini	0,392	0,351
Atkinson (a = 0,5)	0,126	0,100
Atkinson (a = -1)	0,398	0,319
Atkinson (a = -10)	0,659	0,570
Coeficientes de Reynolds-Smolensky, y de Kakwani para gastos y recursos.		
kg	0,341	
g/(1 - t + g)	0,099	
Kt	0,078	
t/(1 - t + g)	0,099	
RSp	-0,041	

(a) se excluye a Capital Federal.   **Fuente:** Elaboración en base al cuadro 3.

5. Descomposición de la desigualdad en la distribución del ingreso a nivel nacional por efectos locales.

En la sección IV, para el agregado país, cada quintil estaba compuesto por la suma de los quintiles correspondientes a cada provincia (unificando a grupos de diferente ingreso). Para subsanar ese defecto, se realizó el siguiente ejercicio. Se consideró el ingreso de cada provincia dividido en quintiles y, tratando a la Nación como una jurisdicción, se ordenó cada quintil de ingreso (sin importar a qué provincia pertenece) en forma descendente según su ingreso per cápita previo a la acción fiscal (cuadro 10)[17].

Cuadro 10. Orden de provincias por quintiles según ingreso per cápita antes de la acción fiscal.

Quintil 5		Quintil 4		Quintil 3		Quintil 2	Quintil 1
Neuquén-5	22.434						
Chubut-5	20.861						
T. del Fuego-5	20.808						
Santa Cruz-5	20.551						
La Pampa-5	19.440						
Río Negro-5	15.393						
Santa Fe-5	15.287						
Mendoza-5	13.590						
San Luis-5	12.554						
Buenos Aires-5	12.482						
Córdoba-5	11.839						
Tucumán-5	11.281						
Salta-5	10.615						
Jujuy-5	10.362						
		Santa Cruz-4	10.007				
		T. del Fuego-4	9.953				
		Neuquén-4	9.940				
		La Pampa-4	9.934				
		Chubut-4	9.324				
Catamarca-5	9.149						
Entre Rios-5	8.961	T. del Fuego-4	12.566				
San Juan-5	8.073						
Corrientes-5	7.953						
		Santa Fe-4	7.305				
		Río Negro-4	6.880				
		Mendoza-4	6.824				
				T. del Fuego-3	6.792		
				Santa Cruz-3	6.738		
				La Pampa-3	6.671		
La Rioja-5	6.525						
Chaco-5	6.354						
Misiones-5	6.259			Chubut-3	6.216		
S. del Estero-5	6.102			Neuquén-3	6.093		
		Córdoba-4	5.928				
		San Luis-4	5.853				
Formosa-5	5.517	Buenos Aires-4	2.352				
		Tucumán-4	5.177			*continúa en la siguiente página.*	
		Salta-4	4.876				

17 . Esta interpretación permite una medición más adecuada (comparado con el método de la sección IV) del impacto distributivo de los presupuestos provinciales. Por ejemplo, en el punto IV el primer quintil de La Pampa ($3.015) se promedia con el de Formosa ($ 628), cuando el primer quintil de La Pampa tiene un ingreso per cápita superior al del cuarto quintil de varias provincias. Esto revela la importancia del recálculo efectuado en este punto (ver cuadro 10).

Quintil 5	Quintil 4		Quintil 3		Quintil 2		Quintil 1	
			Santa Fe-3	4.725				
			Río Negro-3	4.587				
					Santa Cruz-2	4.552		
					La Pampa-2	4.550		
					T. del Fuego-2	4.514		
			Mendoza-3	4.436				
	Jujuy-4	4.337						
	Entre Ríos-4	4.277						
					Chubut-2	4.204		
	Catamarca-4	4.179						
			San Luis-3	3.966				
	San Juan-4	3.873						
					Neuquén-2	3.858		
			Córdoba-3	3.852				
	Corrientes-4	3.791						
			Buenos Aires-3	3.448				
			Tucumán-3	3.435				
					Santa Fe-2	3.181		
			Salta-3	3.159				
					Río Negro-2	3.102		
					Mendoza-2	3.027		
							La Pampa-1	3.015
	La Rioja-4	2.924						
	Misiones-4	2.880						
	S. del Estero-4	2.799						
			Entre Rios-3	2.794				
							Santa Cruz-1	2785
			Catamarca-3	2.768				
					San Luis-2	2.749		
			Jujuy-3	2.737				
			San Juan-3	2.568				
	Chaco-4	2.566						
							T. del Fuego-1	2.566
	Formosa-4	2.532						
					Córdoba-2	2.530		
			Corrientes-3	2.400				
							Chubut-1	2.370
							Neuquén-1	2.322
					Tucumán-2	2.276		
					Buenos Aires-2	2.229		
					Salta-2	2.114		
							Santa Fe-1	1.986
							Mendoza-1	1.941
			Misiones-3	1.865				
					Entre Ríos-2	1.844		
			La Rioja-3	1.844				
					Catamarca-2	1.838		
							San Luis-1	1.816
					Jujuy-2	1.775		
			S. del Estero-3	1.762				
							Río Negro-1	1.749
					San Juan-2	1.699		
			Chaco-3	1.630				
							Córdoba-1	1.623
			Formosa-3	1.606				
					Corrientes-2	1.534		
							Buenos Aires-1	1.380
							Salta-1	1.295
							Tucumán-1	1.284
					La Rioja-2	1.185		
							Jujuy-1	1.171
					S. del Estero-2	1.159		
					Misiones-2	1.156		
							Entre Ríos-1	1.155
							Catamarca-1	1.105
							San Juan-1	1.088
					Formosa-2	1.053		
					Chaco-2	1.048		
							Corrientes-1	958
							La Rioja-1	740
							S. del Estero-1	703
							Misiones-1	699
							Chaco-1	661
							Formosa-1	62

Fuente: Elaboración propia.

Entonces, el coeficiente de desigualdad de Gini puede ser interpretado como el promedio ponderado de las diferencias de ingresos entre todos los pares posibles de grupos de ingreso de la jurisdicción, siendo el denominador el ingreso promedio[18]. Al evaluar el coeficiente a nivel de un país (en este trabajo, la Argentina), la información disponible permite descomponer la desigualdad en tres efectos: (i) la desigualdad en la distribución del ingreso dentro de cada provincia, (ii) la desigualdad ocasionada por la posibilidad de que algún grupo en provincias de bajos ingresos tenga mayor ingreso que algún grupo de provincias de altos ingresos (superposición de grupos de ingresos), y (iii) las diferencias de ingresos medios entre provincias.

El primer efecto surge de sumar los coeficientes de desigualdad de Gini provinciales, ponderados por la participación de cada provincia en la población y en el ingreso del país, El segundo efecto surge de sumar las comparaciones de los grupos de ingreso de a pares de provincias (corregidos por los ingresos medios de las provincias correspondientes), ponderadas por la participación de una provincia en la población y por la participación de la otra en el ingreso. El tercer efecto resume la diferencia de ingresos medios entre provincias (ver Apéndice).

En el cuadro 11 se calcula el aporte a la desigualdad agregada de los tres efectos, antes y después de la acción fiscal. La desigualdad dentro de cada provincia ex-

Cuadro 11. Aportes de los efectos individuales en la desigualdad.

	Coeficiente antes	Participación porcentual	Coeficiente después	Participación porcentual	Cambios en la desigualdad (%)
Efecto desigualdades internas	0,085	20,0(%)	0,075	19,7(%)	11,4
Efecto superposición	0,207	48,6(%)	0,183	47,9(%)	-11,2
Efecto diferencias de ingresos medios	0,133	31,4(%)	0,124	32,4(%)	
Desigualdad agregada	0,425		0,383		-9,9

Fuente: Elaboración propia.

18. Ver, por ejemplo, Pyatt (1976) y Dieguez y Petrecolla (1979). Pyatt le da la siguiente explicación al coeficiente. Se considera un juego donde un individuo de un grupo compara su ingreso (y_i) con el ingreso de otro grupo (Y_j). Si su ingreso es mayor, lo mantiene; si es menor, puede optar por cambiarse de grupo, Si se realiza este juego para todos los individuos (en este caso, entre los quintiles de ingreso de todas las provincias) ponderando cada comparación por la probabilidad de que suceda (donde la probabilidad se mide como el producto del tamaño de la población de cada grupo comparado), se obtiene una ganancia esperada (no negativa) de realizar el juego. Luego, dividiendo por el ingreso medio se obtiene la ganancia esperada en términos del ingreso (que es igual al coeficiente Gini).

plica el 20% de la desigualdad agregada, siendo muy significativos los efectos de superposición (48,6%) y diferencia de ingresos medios (31,4%)[19].

Este nuevo cálculo confirma la conclusión de que la acción de los gobiernos provinciales redistribuye de los grupos más ricos hacia los más pobres. El índice de desigualdad de Gini disminuye de 0,425 a 0,383[20].

La descomposición permite obtener otros resultados de interés. Los tres componentes de Gini cambian en el mismo sentido, debido a la acción fiscal. Si la redistribución territorial de recursos se aproxima con el efecto ingresos medios, entonces mejora la distribución territorial del ingreso. Si la redistribución personal se aproxima con el efecto desigualdades internas, entonces mejora la distribución personal del ingreso. Los efectos resultan, entonces, complementarios[21].

6. Conclusiones.

En este trabajo se presenta evidencia empírica sobre el impacto distributivo de los presupuestos provinciales; como más del 50% del gasto provincial es financiado con transferencias nacionales, los resultados son válidos también para estos regímenes (coparticipación federal y otros). El tema es de gran relevancia para la política económica actual ya que se indaga sobre complementariedad (o colisión) entre redistribución regional y personal del ingreso en un momento en el que la Constitución Nacional manda sancionar un régimen de coparticipación de impuestos entre la Nación y las provincias que distribuya la recaudación en forma "equitativa, solidaria", y que dé "prioridad al logro de un grado equivalente de desarrollo, calidad de vida e igualdad de oportunidades en todo el territorio nacional".

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19. Este resultado es esperable porque el primer componente resulta de la suma ponderada de 23 términos (la desigualdad de las 23 provincias), el segundo de 506 términos (resultantes de comparar cada provincia con las otras 22, dos veces), y el tercero de 253 (resultante de comparar el ingreso medio de una provincia con el de las otras 22).
20. La desigualdad agregada es mayor que la que surge del cuadro 9, debido a que existen 115 grupos de ingreso, mientras que en el otro se realizó una simplificación a 5 grupos.
21. Si los quintiles de cada provincia reciben un tratamiento fiscal distinto, se puede descomponer el efecto redistributivo en dos componentes: equidad horizontal (se cuestiona si la política fiscal impone o beneficia de modo diferente a individuos de ingresos similares) y equidad vertical (resume los efectos de la política fiscal sobre individuos diferentes; es el RSp de la sección IV). De los cuadros 3 y 4, se observa que grupos con similar ingreso reciben un tratamiento diferente. Por ejemplo, el quintil más rico de Chubut "aporta" $813 mientras que el más rico de Tierra del fuego (con un ingreso similar) "recibe" $154; el cuarto quintil de Entre ríos recibe $58 mientras que el cuarto de Jujuy recibe $469. No obstante, no hay reordenamientos importantes, de modo que el efecto en la equidad vertical no es significativo.

Los principales resultados son los siguientes:

1. Los presupuestos provinciales mejoran la distribución personal del ingreso en todas las provincias.

2. En todas las provincias, tanto los gastos como el financiamiento son progresivos (entre personas).

3. Hay grandes diferencias entre provincias en cuanto a los determinantes del impacto de los presupuestos sobre la distribución del ingreso. Hay casos de baja progresividad y gran tamaño (por ejemplo, La Rioja) y otros de alta progresividad y menor tamaño (por ejemplo, Chubut y Buenos Aires).

4. Considerando los resultados a nivel del conjunto de provincias, resulta que los presupuestos provinciales y su financiamiento son progresivos y mejoran la distribución (agregada) del ingreso.

5. Los resultados indican que las provincias de Buenos Aires, Córdoba, Mendoza y Santa Fe son financiadoras netas del resto de las provincias.

6. Los efectos sobre la distribución territorial y personal son complementarios.

Vale reiterar que los resultados son preliminares y que el trabajo no ofrece respuestas suficientemente probadas. Más bien, debe considerarse como un desafío y una demanda por relevamientos de más y mejor información, por análisis teóricos más fundados y respuestas empíricas más probadas. Pese a todas las limitaciones se cree que la dirección cualitativa de los resultados es correcta e indicativa de la realidad.

7. Anexo[22]

1. Introducción.

El trabajo presentado en el texto es parte de un estudio más de tallado en el que se realizaron diferentes supuestos sobre asignación de impuestos y gastos para las provincias (Porto y Cont, 1996).

El estudio se realizó para el año 1991 por haberse obtenido mayor información sobre presupuestos provinciales y por contar con la información de distribución de gastos para la provincia de Buenos Aires (Porto y Gasparini, 1994).

En el comentario de R. Carciofi se advierte sobre los desvíos que pueden resultar de aplicar los criterios de distribución de gastos e impuestos de la provincia de Buenos Aires al resto de las provincias. Se coincide con el comentarista. Cabe mencionar que para 1992 se contó con información sobre la utilización de servicios so-

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22. Este anexo recoge algunas de las sugerencias y observaciones del comentario de Carciofi.

ciales para cuatro aglomerados urbanos, que no difiere significativamente de la utilizada en el trabajo. Como se expresa más adelante, es intención repetir las estimaciones cuando se cuente con información de la Encuesta Permanente de Hogares (EPH) de 1996, en la que se incorporó un módulo para cada aglomerado.

2. Procedimiento para obtener el ingreso primario.

El procedimiento para obtener el ingreso primario fue el siguiente. A partir de los resultados de la EPH para el año 1991 (promedio simple de las ondas de mayo y octubre) para familias, se calculó la distribución del ingreso por quintiles de personas. La conversión a quintiles de personas se realizó del siguiente modo. Se asignó al primer quintil de personas la proporción del ingreso familiar que le corresponde al 20% de personas. El resto se asignó al segundo quintil, con lo que le corresponde al segundo quintil de la Encuesta hasta completar el 20% de las personas. El resto se pasa al tercer quintil, y así sucesivamente. Por ejemplo, se presenta a continuación el cálculo para Buenos Aires.

Cuadro A 1. Asignación de ingresos y población de familias a personas.

	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5
Pf	0.267	0.208	0.198	0.179	0.148
Yf	0.074	0.111	0.156	0.222	0.437
Pp	0.2	0.2	0.2	0.2	0.2
Yf	0.055	0.090	0.139	0.215	0.501

	Q11	Q12	Q22	Q23	Q33	Q34	Q44	Q45	Q55
P	0.200	0.067	0.133	0.075	0.125	0.073	0.127	0.052	0.148
Y	0.055	0.019	0.071	0.040	0.098	0.058	0.158	0.064	0.437

Pf: Población de los quintiles para familias;
Yf: ingreso por quintiles de familias;
Pp: población por quintiles de personas;
Yp: ingreso por quintiles de personas.
Qij: la población o el ingreso que pasa del quintil i de familias al quintil j de personas.

Esta distribución se aplicó a la estimación disponible (no oficial) del producto bruto geográfico (PBG) provincial. Existen dudas sobre las estimaciones tanto del PBI per cápita como de los ingresos promedio de las encuestas de hogares, pero la correlación simple entre ambas variables es de 0.742 (de una regresión lineal se in-

fiere una relación significativamente distinta de cero, aunque significativamente distinta de uno).

La información de EPH comprende sólo núcleos urbanos, lo que puede introducir desvíos dado el diferente grado de urbanización en las provincias. Este punto fue notado por R. Carciofi y es una observación pertinente ya que, por ejemplo, el porcentaje de población urbana es de 97,2% en Tierra del Fuego y 60,8% en Santiago del Estero. Pero la utilizada es la única información sobre la distribución del ingreso. Al evaluar los resultados es un aspecto a tener en consideración.

3. Algunas cuestiones sobre la metodología utilizada.

La metodología utilizada para calcular el impacto distributivo de los presupuestos provinciales está parcialmente presentada en el texto, y está detallada en Porto y Cont (1996). Esencialmente se trata de una aplicación a las provincias de la metodología presentada en Ahumada y otros (1996), que sigue la metodología de Reynolds y Smolensky (1977).

En el comentario de Carciofi se propone un análisis intertemporal para obtener resultados más robustos a la manera de Reynolds y Smolensky. Como destaca en su comentario, esto es particularmente importante teniendo en cuenta los diferentes efectos regionales y locales de la reestructuración productiva y de la descentralización de servicios. Esta es una tarea a realizar en el futuro. Para ello se necesita: (i) mejor información sobre la apertura por finalidad y función de los gastos provinciales; (ii) mejor información sobre el ingreso de las personas (tanto ingreso total por provincias, como su distribución); (iii) información sobre las variables utilizadas para distribuir los gastos provinciales.

4. Distribución de gastos e impuestos por quintiles de ingresos.

La distribución de gastos e impuestos en Buenos Aires aplicada a familias se presenta en los cuadros A.2 y A.3. La corrección a quintiles de personas para cada provincia se realizó con la metodología del cuadro A.1.

Con respecto a los impuestos nacionales que son coparticipados a las provincias se utilizó la estimación de origen y destio de la recaudación de *Cuadernos de Economía Nº 15* y el cálculo de incidencia de Ahumada y otros 1996. Como observa Carciofi, si las bases imponibles difieren entre provincias, una misma estructura de alícuotas puede dar como resultado diferentes estructuras de recaudación.

En cuanto a los tributos provinciales, las estimaciones disponibles sugieren que la "exportación de impuestos" no es significativa (*Cuadernos de Economía* Nº 15).

Cuadro A2. Provincia de Buenos Aires. Año 1991 (en porcentajes).

Finalidades y funciones	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5
1. Administración General	21,58	16,42	19,28	18,43	24,29
2. Seguridad	16,98	16,13	17,67	19,98	29,24
3. Salud	34,81	17,18	25,12	16,02	6,87
4. Cultura y Educación	36,30	20,81	20,63	13,50	8,76
5. Ciencia y Técnica	13,14	13,58	15,91	21,56	35,81
6. Servicios Económicos	13,84	15,84	18,60	21,36	30,36
7. Bienestar Social	24,18	19,06	22,87	17,84	16,05
8. Deuda Pública	0,25	1,93	11,24	15,99	70,59
9. A clasificar	26,49	17,80	20,55	17,11	18,05
Gasto Público Provincial	26,38	17,77	20,66	17,18	18,01

Cuadro A.3. Provincia de Buenos Aires. Año 1991 (en porcentajes).

Finalidades y funciones	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5
Ingresos Brutos	9,70	13,64	19,24	22,46	34,97
Automotores	1,06	4,01	9,18	25,24	60,51
Inmobiliario	1,08	3,38	6,80	20,70	68,04
Sellos	2,53	3,49	21,94	26,85	45,19
Sin clasificar	2,65	5,00	11,95	22,74	57,66
Recursos de Jurisd. Nacional (Origen)	4,79	8,63	14,22	21,79	50,57
Total recursos	4,21	7,66	13,61	22,04	52,48

8. Apéndice.

Siguiendo a Pyatt (1977) y Dieguez y Petrecolla (1979), se presenta el coeficiente de la desigualdad de Gini presentado en la nota al pie 10 (que corresponde a 23 provincias con 5 grupos de ingreso cada una) como

$$GL = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} p_i \, p_j \left| Y_i - Y_j \right|}{2 \, \overline{Y}} = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} p_i \, p_j \; max \, (0. \; Y_i - Y_j)}{\overline{Y}}$$

Donde p_i (p_j) es la participación del grupo i (j) en la población total del país; Y_i (Y_j) es el ingreso del grupo i (j); $\overline{Y}$ es el ingreso promedio del país. Este coeficiente

se puede descomponer como (se define h (g) como el número de provincias -23, en orden ascendente de ingresos medio- e i (j) el número de grupos de ingreso dentro de cada provincia -5-):

$$GL = \frac{1}{\overline{Y}} \left\{ \sum_{h=1}^{23} \left(\sum_{i=1}^{5} \sum_{j=1}^{5} p_{hi} \, p_{hj} \, max\,(0,\, Y_{hi} - Y_{hj}) \right) + \sum_{\substack{h=1 \\ h \neq g}}^{23} \sum_{g=1}^{23} \left(\sum_{i=1}^{5} \sum_{j=1}^{5} p_{hi} \, p_{gj} \, max\,(0,\, Y_{hi} - Y_{gj}) \right) \right\}$$

Donde p_{hi} (p_{hj} o p_{gj}) es la participación del quinti i (j, j) en la provincia h (h, g) en la población total.

A su vez, si se multiplica y divide la primera suma por p_h^2 (donde p_h es la participación de la provincia h en la población); y se multiplica y divide la segunda suma por $p_h \, p_g$ y se define:

$$e_{hh} = \sum_{i=1}^{5} \sum_{j=1}^{5} \frac{p_{hi}}{p_h} \frac{p_{hj}}{p_h} \, max\,(0,\, Y_{hi} - Y_{hj})$$

$$e_{hg} = \sum_{i=1}^{5} \sum_{j=1}^{5} \frac{p_{hi}}{p_h} \frac{p_{gj}}{p_g} \, max\,(0,\, Y_{hi} - Y_{gj})$$

Entonces,

$$GL = \frac{1}{\overline{Y}} \left\{ \left(\sum_{h=1}^{23} p^2_h \, e_{hh} \right) + \left(\sum_{\substack{h=1 \\ h \neq g}}^{23} \sum_{g=1}^{23} p_h \, p_g \, e_{hg} \right) \right\}$$

Pyatt (1977) demuestra que si $\overline{Y}_g > \overline{Y}_h$ entonces $e_{gh} = e_{hg} + \overline{Y}_g - \overline{Y}_h$

Por otro lado, definiendo

$e_{hg}{}' = e_{gh}{}' = min\,[\,e_{hg}{}' \, e_{gh}\,]$, el Gini queda expresado como,

$$GL = \frac{1}{\overline{Y}} \left\{ \left(\sum_{h=1}^{23} p^2_h \, e_{hh} \right) + \left(\sum_{\substack{h=1 \\ h \neq g}}^{23} \sum_{g=1}^{23} p_h \, p_g \, e'_{hg} \right) + \left(\sum_{\substack{h=1 \\ g > h}}^{23} \sum_{g=1}^{23} p_h \, p_g \, (\overline{Y}_g - \overline{Y}_h) \right) \right\}$$

Si el individuo más pobre de la provincia g tiene mayor ingreso que el individuo más rico de la provincia h, entonces $e_{hg}{}' = e_{gh}{}' = min\,[\,e_{hg}{}' \, e_{gh}\,] = e_{hg} = 0$, y la diferencia entre las dos provincias se resume en la diferencia de sus ingresos medios. En cambio, si hay superposición de grupos de ingreso entre las dos provincias, la diferencia entre las mismas puede resumirse en: (a) la desigualdad ocasionada por el hecho de que algún grupo en la provincia h tiene mayor ingreso que algún grupo en la provincia g (superposición de grupos de ingreso; es el segundo sumando), y (b) las diferencias de ingresos medios entre provincias (es el tercer sumando).

Por último, dividiendo y multiplicando el primer sumando por $\overline{Y}_h$ y los sumandos segundo y tercero por el correspondiente $\overline{Y}_h$

$$GL = \left\{ \left(\sum_{h=1}^{23} \pi_h \ p_h \ GL_h \right) + \left(\sum_{\substack{h=1 \\ h \neq g}}^{23} \sum_{g=1}^{23} \pi_h \ p_g \ e^*_{hg} \right) + \left(\sum_{\substack{h=1 \\ g > h}}^{23} \sum_{g=1}^{23} \pi_h \ p_g \left(\frac{\overline{Y}_g - \overline{Y}_h}{\overline{Y}_h} \right) \right) \right\}$$

Donde $\pi_h = p_h \overline{Y}_h/\overline{Y}$ es la participación de la provincia h en el ingreso total del país; $GL_h = e_{hh}/\overline{Y}_h$ es el coeficiente de desigualdad de Gini de la provincia h; $e^*_{hg} = e'_{hg}/\overline{Y}_h$. Entonces, el primer término resume el efecto de las desigualdades en cada provincia. El segundo término resume el efecto superposición (si, por ejemplo, las provincias h y g son idénticas tienen grupos del mismo tamaño con el mismo ingreso-, e^*_{hg} tiene igual valor que el Gini de las dos provincias; en cambio, si el individuo más pobre de la provincia g tiene mayor ingreso que el más rico de la provincia h, el coeficiente toma valor 0). El tercer término resume el efecto de la diferencia de ingresos medios entre provincias.

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Personal and Regional Redistribution Through Public Finance.

The case of provincial governments in Argentina.

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Resumen.

En un sistema federal, la distribución del ingreso es afectada por las decisiones del gobierno (nacional, provincial, municipal) en al menos dos dimensiones: personal y regional. A través del presupuesto público, y de la interacción entre impuestos y gastos, las decisiones de un gobierno provincial impactan sobre la distribución personal del ingreso. Por su parte, la distribución regional del ingreso también se ve afectada si los presupuestos provinciales se financian con regímenes de transferencias desde la nación (por ejemplo, vía coparticipación de impuestos), porque estos regímenes redistribuyen recursos entre provincias.

La mayoría de los trabajos de investigación se concentran en el impacto del presupuesto público sobre la distribución personal o regional del ingreso separadamente, mientras que solo unos pocos integran ambos efectos.

Este paper analiza el impacto del presupuesto público provincial (que representa aproximadamente la mitad del gasto público consolidado, mientras que aproximadamente 60% de los recursos para afrontarlo provienen de regímenes de transferencias) sobre la distribución del ingreso en Argentina utilizando información presupuestaria del año 2004. El mismo revela la importancia de considerar el impacto de la política fiscal sobre la distribución del ingreso a nivel provincial, ya que los efectos difieren por provincia y la agregación de provincias esconde efectos interprovinciales (de provincias financiadoras a provincias receptoras netas). En las provincias receptoras netas la progresividad del presupuesto provincial se re-

fuerza por el efecto (positivo) de las transferencias mientras en las jurisdicciones financiadoras se produce un trade-off entre progresividad y el efecto (negativo) de las transferencias. En este grupo, sin embargo, el efecto neto del presupuesto provincial es progresivo.

JEL Code: H7, I3.

Abstract.

In a federal system, income distribution is affected by the decision of many public economic agents in at least two dimensions: personal and regional. Through public budgeting, and the interaction of expenditures and taxes, a subnational government typically affects the personal distribution of income, and also the regional distribution of income if the subnational budget is financed with national taxes, through revenue-sharing (coparticipation) regimes -because this regime redistributes tax revenues among provinces.

Most research in this field focuses on the impact of public budget on either personal or regional distribution of income. Very few papers integrate both effects. This paper studies the impact of provincial government budgets (which represent around 50% of total public expenditures, and around 60% of funds to finance them comes from revenue-sharing) on the distribution of income in Argentina using budget information for year 2004.

This paper reveals the importance of considering the impact of fiscal policy on income distribution at the provincial level, because effects are different by province. The aggregation of provinces hides inter-provincial effects because some province may finance or benefit from the revenue-sharing scheme. Taking this effect into consideration, we find that the progressiveness of subnational expenditures and taxes interact with the revenue-sharing regime, reinforcing progressivity in "net-receiving" provinces but creating a trade-off between progressivity and (negative) regional transfer in "net-financing" ones. In the latter provinces, however, the net effect of provincial budget is also progressive.

1. Introduction.

In a federal system, income distribution is affected by the decision of many public economic agents in at least two dimensions: personal and regional. Through public budgeting, and the interaction of expenditures and taxes, a subnational government typically affects the personal distribution of income, and also the regional distribution of income if the subnational budget is financed with national taxes

through a revenue-sharing (coparticipation) regime, because this regime redistributes tax revenues among provinces.[23]

Most research in this field focuses on the impact of public budget on either personal or regional distribution of income. Very few papers integrate both effects. Also, the approach to measure this impact has been diverse, using national budget, provincial budget (and, to a less extent, municipal budget) or the consolidated public sector budget.

This paper studies the impact of each provincial government budget on the distribution of income using budget information for year 2004.[24] Provincial expenditures represent around 50% of consolidated public expenditure in Argentina. Moreover, around 60% of funds to finance this expenditure come from revenue-sharing schemes, i.e., national taxes collected across the country. Starting from an assumption of balanced budget at the aggregate provincial level (total expenditure equals total collected revenue), each province may finance or benefit from the revenue-sharing scheme. An analysis that assumes regional aggregation necessarily hides inter-provincial effects, biasing conclusions in some direction.

In Porto and Cont (1998), the authors expressed that Kuznets' (1955) thoughts constituted a stimulus for additional research. In that paper, the authors concluded that "…the results are preliminary and ... the paper does not offer enough proved answers. Rather, it should be considered as a challenge and a demand for more and better data gathering, for more theoretical and empirical founded work. Taking into consideration the limitations of the paper, we believe that the qualitative direction of the results is correct and indicative of reality." (p. 285). In this paper, we come back to the issue with similar qualifications, and taking also into account Dalton's words (1929): "Those who are oppressed by a sense of difficulty of this calculus, should console themselves with the saying of the Ancient Greeks that 'it is not the easy things, but the difficult things, that are beautiful'." (p. 15).

The main results of the paper are summarized as follows. The positive distributive impact of subnational expenditures and taxes interact with the revenue-sharing regime, reinforcing progressivity in net-receiving provinces but creating a trade-off between progressivity and (negative) regional transfer in net-financing ones. In the latter provinces, however, the net effect of provincial budget is also pro-

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23. It is assumed that there are no interjurisdictional fiscal externalities. Otherwise, in the cases of tax export or expenditure spillover, a subnational government would also affect the regional distribution of income directly.

24. We approximate the solution to the impact of provincial fiscal policy on income distribution as the estimation, for each income group, of the income before and after fiscal policy, both at the same existing equilibrium.

gressive.[25] We test the results for different assumptions on tax burden and externalities from expenditures. In order to show these results we proceed as follows. In Section 2, we put the paper in context by reviewing the literature on fiscal policy and income distribution. In Section 3, we provide the basic definitions and the methodological framework. Section 4 and 5 present the main results and extensions. Finally, Section 6 concludes.

2. Brief review of the (large) literature.

Income distribution has been, from both a theoretical and historical perspective, one of the most intense research areas in economics. Research has been divided in positive approach, i.e., the study of the laws of income distribution in a capitalist economy, and normative approach, i.e., the study of the instruments to modify such distribution following some value judgment. Rigorous analysis of the first approach dates from the beginning of the XIX Century, with Ricardo (1817) for whom "the principal problem of political economy was the determination of the laws governing the distribution of national income among the classes of society" (p. 5).[26] The Ricardian theory gave birth to two principles of income distribution: the "marginal principle" and the "surplus principle". The first principle is adopted by the Neoclassic School (see Hicks, 1932), and the second is adopted by the Marxist School (see Dobb, 1972).

Under the second and more recent approach, the relevance of income distribution in the research agenda was not as central as in the positive approach. In fact, this relevance depended on the nexus between the fiscal theory and the theory of the state, which evolved along two variants (Musgrave, 1996). The first one is the "service state", which establishes that the main role of the state is to allow the proper function of the market economy by providing a legal system, protection to society from foreign aggressions, public works that –because of size– cannot be provided by the private sector and the basic education to the poor. Since the tax principles according to benefits and ability to pay were assumed to coincide, the distributional impact of fiscal policy would be neutral.[27] The second variant is the "welfare state", aimed to correct the income distribution which results from market

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25. Even though this methodology is applied to provincial expenditures and taxes within a federal system, it can also be applied to the national budget. This is the subject of a forthcoming paper.

26. Ricardo refers to the distribution among landowners, owners of capital and workers (p.5). The quote corresponds to the Spanish version (1973).

27. This is Musgrave's (1996) interpretation of A. Smith. Many papers treated both principles separately. For a long time, attention tilted to the distribution of the tax burden according to ability to pay, independently from the benefit principle. Taking into consideration decreasing marginal utility, some papers found that tax rates should equate post-tax income (Edgeworth model of optimal income taxation; see Rosen, 1995).

forces.[28] Several questions arose throughout the development of this variant.

A first question regarded the level of government that should be responsible for the income distribution task in a federal (multilevel) public sector: national, provincial or local, or all of them, in which case a second question would be how to share this responsibility. The early answer to both questions was clear. Musgrave (1959) and Oates (1972) concluded that the central theme of fiscal federalism is found in the proposition that the provision of services should be assigned among the different levels of government, but the stabilization and distribution branches should be concentrated at the national level.

A third question regarded the relevant dimension of distribution: Should the aim of the public policy be the regional distribution of income, the personal distribution or both? The answer in this case was that personal distribution of income should be the matter of concern, because the arguments included in the welfare function are individuals' utilities. Moreover, there was recognition of a possible failure in the regional distribution principle. In particular, it could be the case that regional redistribution could generate a result in which rich people from poor regions be subsidized by poor people from rich regions.

Empirical research followed these guidelines. The leading focus of such research was the impact of national (or consolidated) public budget on personal income distribution, while the regional dimension was relegated to play a supporting role. As a consequence, analysis of the relationship between personal and regional dimensions of income distribution was even less explored.

The early propositions of allocating income distribution policy to the national government and focusing attention on personal distribution of income were both subject to challenges. First, the literature that followed recognized the existence of constraints for decentralized redistributive policies, because of mobility of goods and factors across regions (Oates, 1972, King, 1984, Brown and Oates, 1987). But, on the theoretical side, Pauly (1973) justified the sub-national government interventions with a model in which the utility function of rich households is altruistic (i.e., it depends on both own and poor's disposable income). Wildasin (1992) analyzed the effect of the growing factor mobility as a restraining factor to local redistributive policy, not only among regions within a country but also among countries. As a result, rich households would accept to transfer part of their income to low-income neighbors. Bird (1995) raised another point concerning the functions of the different levels of government by stating that "A government, whether local or central, that is not concerned with distribution is less a government than simply

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28. There is a third approach, that goes back to positive theory and considers a "flawed state" because, among other reasons, pursues the objective of bureaucrats and/or politicians that capture the fiscal apparatus fulfilling own goals rather than general interest (Brennan and Buchanan, 1977, 1978).

one of the many alternative organizational structures that may be used to deliver certain services". Recently, Tresch (2002) set up a hierarchically nested structure of welfare utilities to argue that "It is no longer true that redistributions among people at the national level are the 'preferred alternative', as Oates claimed. In the alternative model presented here, only the lowest level government redistributes among the people. The higher governments use grant-in-aid to other governments exclusively in their redistributions." (p. 851).

On the empirical side, the evidence points to the existence of a significant impact of sub-national governments' budget on regional distribution of income, especially due to revenue-sharing regimens. Moreover, country Constitutions and legal documents include dispositions that define regional distribution of income as an objective to fulfill.[29]

First efforts to measure the impact of fiscal policy on income distribution concentrated mainly on tax incidence (among others, Musgrave and Thin, 1948, and Musgrave, 1964). However, Musgrave (1964) acknowledged that "… any meaningful theory or policy of public finance must ultimately combine the issues posed by the two sides of the budget. This, indeed, is the cardinal principle of the economist's view of public finance. The distributional implications of expenditure policy, therefore, pose an important further problem."

Before starting with the proposed analysis of the impact of provincial budgets on the income distribution in Argentina we want to mention that this country has been a fruitful research field in the area of income distribution and the impact of public policy. Herschel (1963) is the first study that estimates regional and personal distribution of income and the impact of fiscal policy. Dieguez and Petrecolla (1979) study in detail the determinants of income distribution in the Great Buenos Aires. Petrei (1989) analyzes the case of public expenditure in education, health, social security, housing and water and sewerage in five Latin-American countries (Argentina, Costa Rica, Chile, Dominican Republic and Uruguay). Dieguez, Llach and Petrecolla (1991) estimate of the net subsidy associated to the argentine social policy, disaggregating expenditure by the most relevant categories.

Several papers analyze in detail aspects of the impact of social expenditure on

29. Some examples of Constitutions and legal documents that define the regional distribution of income are Canada ("Parliament and the Government of Canada are committed to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation", Constitutional Act, 1982) and Argentina ("The distribution between the Nation, the Provinces and the city of Buenos Aires, and among them […], will be fair, solidary and will give priority to the achievement of an equivalent level of development, life standard and equal opportunities throughout the national territory" National Constitution of 1994, Art. 75° inc. 2). The regional cohesion policy, included in the Project of the European Constitution in 1994, is another case.

personal income distribution taking as a geographical unit Argentina or certain provinces (Ahumada *et al*., 1994, Flood *et al*., 1994, Gasparini and Porto, 1995, Gasparini *et al*., 1998, Porto and Cont, 1998, DNPGS, 1999, DGSC, 2002, Bertranou and Bonari, 2003, CEDLAS-DGSC, 2004, and Feldman and Filc, 2007), or concentrating on specific expenditures (Paqueo and Lee, 2000). Others study the existence of complementarities or trade-offs created by fiscal policy on personal and regional distribution of income in a federal system. For example, Porto (1990) and Porto and Sanguinetti (1993, 2001) find evidence of a strong regional redistribution throughout the revenue sharing regime. Porto (1990) and Artana and Lopez Murphy (1995) suggested opposite effects of government budgets on personal and regional distribution of income in Argentina. Porto and Cont (1998), the antecedent of this paper, find a net complementarity effect at a provincial level.

3. Methodology.

We follow the traditional methodology of benefit-incidence analysis from, among others, Musgrave and Thin (1948), Musgrave (1964), and Reynolds-Smolensky (1977). We apply the methodology to provincial public budget in several steps. First, we must provide an ordering of individuals according to a measure of *ex ante* income distribution (that is, income before provincial fiscal budget). Second, we must identify and distribute both expenditures and revenues to each individual or group of income in each province. Third, the *ex post* income is the initial income after adding expenditure benefits and deducting net taxes.[30] The final step is the comparison between the *ex ante* and *ex post* distributions of income, i.e., those before and after fiscal policy, with some methodology. Given that the objective of this paper is to study the impact of provincial fiscal policy on regional and personal distribution of income, we use the Gini index of inequality, the Atkinson index of inequality and the calculation of the welfare level in each province by using the Atkinson index of welfare.

3.1. Income and distribution of income.

We present income distribution in each province by dividing households into five groups (quintiles) of population. We take the distribution of per capita household income from the Permanent Household Survey (*Encuesta Permanente de Hogares*), or PHS, published by the National Bureau of Statistics (INDEC) for year 2004 (average of for quarterly surveys), and expand the reported incomes by a factor such that the total income from the PHS equals the Gross Domestic Product

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30. Taxes paid to the provincial government and net taxes paid to the national government, considering the source and the destination of national transfers.

(GDP, which equals $11,700, or approximately US$ 3,900, per capita).[31] We allocate the GDP by jurisdiction according to Gross Geographical Product (GGP),[32] in order to determine total group income in each province. Finally, we divide the expanded income by group population to determine per capita income by quintiles in each province, which is the starting point to assess income distribution.[33] Table A.1 in the Appendix presents the per capita income in each province and Table A.2 reports the distribution by quintiles. Differently from the mainstream in income distribution analysis, we do not correct this income by equivalent adult. The main reason is the purpose of the study, which adds expenditures and taxes to get an ex post income.[34]

Finally, we calculate the impact of fiscal policy on income distribution including and excluding the city of Buenos Aires (the capital of Argentina) in the analysis. We must warn that the inclusion of the city of Buenos Aires in the analysis raises two issues. On the one hand, the level of activity is so important that a significant fraction of national revenues is collected in the city, while coparticipation to this jurisdiction (and its relative level of expenditure) is very low compared with the national taxes collected there. The exclusion of the city from the analysis implies that the pool of 23 provinces receives a net transfer. On the other hand, the government of the city of Buenos Aires does not spend in some categories (police, justice and some economic services), which are responsibility of the national government. Therefore, the inclusion of this jurisdiction leads us to compare different levels of expenditure among provinces.

3.2. Provincial budget and its distribution.

We concentrate on provincial budget, which represents around 50% of consolidated public budget according to data from the Secretariat of Treasury. With the exception of two provinces, the budget ended with a surplus in year 2004, and we

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31. We report the information in domestic currency (argentine pesos). The exchange rate to the US dollar was around $3/dollar in year 2004.

32. We use ECLAC statistics of Geographical Gross Product.

33. Throughout the paper we treat gross product and ex ante income as the same. There is a significant difference between them depending on the subject under study. In this case, we consider it appropriate to use both GDP and GGP as measures of ex ante income because we deduct taxes and add expenditures to obtain ex post income. In others cases, it may be more appropriate to use a definition of household net income (that is, after taxes and subsidies).

34. This kind of correction may lead us to take many other factors into consideration, such as, for example, how to convert a peso spent in public administration or education by "equivalent beneficiary", in addition to all the assumptions done to distribute such expenditures following a benefit principle.

made the following changes to make it balance. Since the surplus balance still held even excluding two provincial-revenue lines (revenues from asset sales and property income), we closed the balance, first, by deleting these two revenue lines, and second, by increasing provincial expenditure proportionally by categories. In two provinces, Formosa and Tucumán, we closed the deficit by increasing provincial taxes proportionally to close the gap (in those provinces, asset sales and property income were irrelevant).[35] The statistics for expenditure, and national and revenues are reported in Table A.1 and explained in the Appendix.

Figure 1 may be helpful to understand the flows in provincial budgets. This paper leaves aside national budget (which also affects regional and personal income distribution through expenditures and taxes, see (1) and (2) in the Figure) and concentrates on provincial budgets. Provinces finance their expenditure (5) with local revenues (i.e., (6), own taxes collected within their jurisdiction), (4) transfers from de national government (which come from taxes collected throughout the country) and debt, in case of deficit.

By construction, total national transfers by source (3) equal total national transfers by destination (4), but some provinces are net receivers (that is, they receive in transfers more than they contribute through national taxes collected in their jurisdiction) and others are net financers. Moreover, if the jurisdiction left outside the sample is a net financer (the city of Buenos Aires) the group under analysis is net receiver of national transfers.

Figure 1: Source and destination of funds in provincial budgets.

Household	Link household-province	Provinces
		(1) Taxes from province j to finance national budget
		(2) National expenditure in province j
		(1)-(2) is a net-transfer to other provinces
Incidence of taxes and expenditures on households' utility		(3) National taxes from province j to coparticipation
		(4) Coparticipation funds received by province j
		(3)-(4) is a net transfer to other provinces
(income + expenditure-taxes)		**(5) Province j's expenditure**
		(6) Province j's taxes
		(5)-(6)-(4) is provincial deficit (debt)

35. The corrections on expenditures and taxes fulfill the condition that current taxes will be spent in the future (distributed by categories as in the year under study) and that current deficits will be closed by future taxes (following the same tax scheme as in the year under study).

As a final step, we calculate an *ex post* income. By following the standard procedure, the allocation of expenditures and taxes among quintiles in a province exhaust the province's budget (that is, we assume neither debt nor surplus). We also discuss alternative effects for expenditures (spillovers) and taxes (export).

3.3. Conceptual framework for measurement. [36]

The measurement of the impact of fiscal policy on income distribution can be done as a standard comparative statics exercise between ex ante and ex post income distributions, where the ex post income is the ex ante income plus provincial expenditure less taxes (by source jurisdiction), for every household in each province.

Formally, consider a province n with i households (labeled n=1, …, N and i=1, …, I, respectively). For simplicity, *I*=5 and *N*=24 reflect the case of quintiles in the Argentine provinces (N=23, if we exclude the city of Buenos Aires).

Let m_{in} be the individual income before provincial fiscal policy, g_{in} the benefits of provincial (n) expenditure and t_{in} the total taxes paid to finance the provincial expenditure. The ex post individual income is

$$c_{in} = m_{in} + g_{in} - t_{in} \tag{1}$$

Expenditure in province n is $g_n = \Sigma_k g_{kn}$, i.e., the sum of expenditures in k categories (education, health, administration, etc.). Each expenditure k is distributed among households according to weights $_{ik}$, so that $g_{in} = \Sigma_k{}_{ik} \cdot g_{kn}$. An individual i in province n pays s different provincial taxes (turnover, stamps, property, vehicles, etc., labeled t_{sn}), according to weights τ_{is}, and r national taxes (VAT, consumption, income, etc., labeled t_r), according to weights $\tau_{ir,n}$. Therefore, $_{in} = \Sigma_s \tau_{is} \cdot t_{sn} + \Sigma_r \tau_{ir,n} \cdot t_{in}$. We also define $a_n = \Sigma_{in} (\Sigma_r \tau_{ir,n} \cdot t_r)$, which stands for the contribution of province n to national taxes that fund the aggregate provincial budget system. The h×k matrix labeled B_n summarizes the expenditure weights; the h×s (h×r) matrix T_n (X_n) summarizes the provincial (national) tax weights. Each column in B_n, T_n and X_n adds up to unity. Using these definitions, equation (1) can be rewritten as

$$c_{in} = m_{in} + \Sigma_k{}_{ik} \cdot g_{kn} - \Sigma_s \tau_{is} \cdot t_{sn} - \Sigma_r \tau_{ir,n} \cdot t_r \tag{2}$$

The budget constraint for a government in province n is

$$\Sigma_k g_{kn} = \Sigma_s t_{sn} + d_n$$

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36. Part of this framework is adapted from Ahumada et al. (1996).

where d_n is the national transfer according to the tax sharing regime (this assumes zero debt or surplus). Comparing (2) and (3) there is a transfer among provinces depending on the difference between a_n and d_n.

At a provincial level the term d_n - a_n may be positive or negative. A positive residual means that the province receives a net transfer from the other provinces (that is, it is a "net receiver"), while a negative residual means that the province finances the other provinces (that is, it is a "net financer" or "net contributor"). At an aggregate level, if the city of Buenos Aires is included the following condition is met: $\Sigma_n\, d_n = \Sigma_n\, a_n$. But if the city is excluded from analysis, there is a net contribution (NC) to the group of provinces summarized as (labeling the city of Buenos Aires with 1):

$$NC = \sum_{n=2}^{24} \left(d_n - a_n\right)$$

When analyzing income distribution, we will use taxes and expenditures from equations (2) and (3) to calculate Gini coefficients of income inequality. For a given jurisdiction, this coefficient is calculated as

$$G = 1 + \frac{1}{I} - 2\sum_{i=1}^{I} \frac{(I+1-i)y_i}{I^2 y^P} \tag{4}$$

where income groups are ranked from lowest (i=1) to highest (i=5), I=5, given that we work with quintiles, y = m, c (that is, ex ante or ex post income), and y^P is the average income of the group under analysis. To assess the impact of fiscal policy on income distribution we use the Reynolds and Smolensky (1977) indicator (RSp). The application of this indicator to the aggregate of N jurisdictions is

$$RSp = -\,t\,(Kt + Kg)$$

where t is the relative size of taxes (taxes / GGP), which equals the relative size of expenditures (expenditure / GGP), labebed g. Kt and Kg are the Kakwani (1977) progressivity indexes of taxes (equal to the difference between the concentration of taxes and (4)) and expenditures (equal to the difference between (4) and the concentration of expenditures). For a particular province, the RSp is

$$RSp = -\left(\frac{t}{1-t+g}Kt + \frac{g}{1-t+g}Kg\right) \tag{5}$$

where α is the inequality aversion coefficient, which takes values less than or equal to 1 (with a corresponding transformation if α=0). To focus on the welfare effect of fiscal policy, we calculate the net effect using a per-capita Atkinson-like welfare function.

$$D(\alpha) = 1 - \frac{y^*}{y^P}, \quad \text{where} \quad y^* = \frac{1}{I}\left(\sum_{i=1}^{I} y_i^{\alpha}\right)^{1/\alpha} \tag{6}$$

where α is the inequality aversion coefficient, which takes values less than or equal to 1 (with a corresponding transformation if $\alpha=0$). To focus on the welfare effect of fiscal policy, we calculate the net effect using a per-capita Atkinson-like welfare function.

$$W(...y_i...) = \left(\sum_{i=1}^{I} y_i^{\alpha}\right)^{1/\alpha} = (1 - D(\alpha))y^P \tag{7}$$

where y=c,m, and the addition of weighted incomes corresponds to households in a province or in a country.

Many issues arise from a comparison of equations (2) and (3) and their application to (4)-(7). First, they reveal the importance of considering the regional factor in an analysis of impact of public budgets on income distribution, not only because each region may have different ex ante income, but also because they may have their own incidence patterns for provincial taxes (T_n) and expenditures (B_n), in addition to different level and mix of expenditures (g_n), taxes (t_n), contribution to national taxes (a_n), and reception of transfers from the upper level of government (d_n).[37]

Second, a full analysis of equation (2) must include all expenditures and taxes to assess the impact of provincial budget on income distribution. After the rupture of the principle of coincidence between benefit and ability to pay, both theoretical and empirical studies engaged in a first stage of partial analysis (biased to taxes), but later it was recognized that the tax and expenditure problems could not be treated separately. From the distributional standpoint, it is of little worth to count with a progressive expenditure if it is financed with very regressive taxes. Along the same lines, a social expenditure (the focus of many research papers on public policy and income distribution) may be progressive but total expenditure may be regressive, turning the partial analysis incomplete and misleading. In fact, the theory of state failure visualizes that expenditures, or a share of them, are tilted towards groups that take over the fiscal apparatus. Although it is difficult to quantify this ef-

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37. This issue is not only relevant when analyzing provincial budgets but also for national budget. In this case, d_n is a "fiscal residual" in each province, calculated as the difference between the benefits from national expenditure accrued in such province and the national taxes paid by its residents.

fect beyond ad hoc assumptions on leakages, the inclusion of all expenditures –with their own distribution pattern– may help to understand the problem in a more complete way. For the same reasons it is necessary to include all taxes (legislated and non-legislated) since the tax structure (tax base, deductions, exemptions, and tax rates) are the result of a political-economics equilibrium.

Following Musgrave (1964) in the consideration of both sides of the budget (that is, the inclusion of all expenditures and taxes that enter equations (2) and (3)), we must identify first the taxes and expenditures for the *level of government* under research (consolidate, national, a provincial government, the set of provincial governments, etc.). Then we must consider the *regional dimension*, because personal income, taxes and expenditures are not uniformly distributed across regions. When assessing taxes, one must consider the *direct cost* and the *excess burden*; when calculating expenditures, one must take care of *efficiency differentials* between private and public sectors, *leakages* in certain expenditures to non targeted beneficiaries, and possible *externalities* due to benefits that are spilled over to other groups.

Third, we take an additional step in estimating the tax incidence. Taxes in equation (3) are measured by their direct collection cost, i.e., the direct transfer from private sector to the government. Raising taxes also imply indirect costs, or excess burden (Pigou, 1947, Atkinson and Stern, 1974), which may have an own incidence pattern. Although it is well known that the quantification of this effect is a difficult task, it should be taken into consideration when evaluating impacts of fiscal policy on income distribution. For example, the bigger the size of the public sector, the larger the excess burden (Harberger, 1974), and c_n could be higher than m_n after fiscal policy, but lower after taking into account the excess burden accrued to the household.[38]

Fourth, we also analyze alternative scenarios for expenditure incidence. In the beginning of the 1970s, Aaron and McGuire (1970) presented a method to estimate the distribution of the public component of the expenditure among different groups

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38. The magnitude of excess burden may be significant. For example, Ballard, Shoven y Whalley (1985) estimated, in a general equilibrium model, that the excess burden may vary from 15 to 33 cents per dollar of tax raised, depending on the tax and the assumptions made on the elasticities of supply of labor and savings. Feldstein (1997) used a method that divide goods in an appropriate way for tax purposes and found a marginal excess burden per dollar of revenue of 1.65 in the United States. That is, the marginal cost of raising an extra dollar increasing all marginal tax rates proportionally is 2.65 dollar. He concludes that "The central public finance question facing any country is the appropriate level of public spending and, therefore, of taxes. As specialists in public finance, we have a particular responsibility to help the public and the politically responsible officials to deal with this question…".

of households, considering the need to distinguish between public expenditure in goods that are appropriated fully by privates (publicly provided private goods) and public expenditures that benefit all society (public goods). The fundamental problem with public goods –or the public component of the publicly provided goods– is how to allocate them to every population group. Aaron and McGuire show that the value of these goods for different groups depends on shape of the households' utility function. In many papers the public component of publicly provided goods is distributed equally among groups. According to Aaron and McGuire, this allocation could be sustained under the assumption of a constant marginal utility of income. But, if the utility function displays diminishing marginal returns, the resulting allocation is larger for individuals who belong to quintiles of higher income, and each group receives an allocation that comes from multiplying the total value of the good and the inverse of the marginal utility of income.

The alternative scenario allocates the public good share of publicly provided goods based on ad hoc assumptions regarding the magnitude, and implicit assumptions on the value of the externality for every receptor of the benefits. As Aaron and McGuire show "…the selection of a utility function critically influences one's results…". In particular, we will assume (ad hoc) that the external benefit is proportional to income within each group. That is, the value of the expenditure allocated to group i equals $g.(y_i/\Sigma_H y_i)$ where g is the expenditure to be distribute among quintiles, y_i is the i-quintil's income. The indirect utility function which is compatible with this assumption is

$$V_i = f(y_i) + g \times \frac{y_i}{\sum_{j=1}^{H} y_j}$$

In sum, this paper estimates the impact of provincial budgets on income distribution following the standard literature, calculating some of the typical progressivity indexes for expenditures, taxes and distributional impact. Then, it advances in four directions, usually omitted by the standard literature: (i) the consideration of both sides of the budget for the level of government considered –provincial, in this case–, revenues and expenditure; (ii) the consideration of the regional impact of provincial budgets, given the interregional transfers and different designs of provincial budgets; (iii) the consideration of the excess burden of taxes; and (iv) the consideration of the externality, or public component of publicly provided private goods (either in the form of direct externality or of leakage). These dimensions, although treated in an ad hoc fashion, provide results that must be considered *once again* "…as a collection of hunches calling for further investigation……" (Kuznets, 1955).

4. Results I: the standard methodology.

4.1. Preliminaries.

Table A.1 in the Appendix summarizes the average values of income, provincial expenditures and taxes and national revenues raised to finance provincial budgets. Provinces in Argentina are different in many dimensions. For an average per capita income of $11,710, the richest province's per capita income (Santa Cruz, with $34,743) is almost eight times the poorest one (Formosa, with $4,377). These differences are also present in expenditures and revenues. Provincial expenditure ranges from 45%-50% of the income (in La Rioja and Formosa, respectively) to 5%-10% (in the city of Buenos Aires and the province of Buenos Aires, although in the first case some local public expenditures are provided by the national government). Taxes range from 17%-18% of income (in Tucumán and Neuquén) to 7%-9% (in San Luis and Catamarca). Some additional differences are revealed in the comparison: for example, even though La Rioja Catamarca and San Luis are net receivers of funds and display a low level of revenues, provincial public expenditure in La Rioja is significantly higher than expenditure in Catamarca, which is also higher than expenditure in San Luis.

Three jurisdictions (the city of Buenos Aires, the province of Buenos Aires and, to a little extent, Mendoza) are identified as net financers. That is, a_n, the difference between transfers by destination and transfers by source, is negative. Córdoba and Santa Fe, which used to be net financer provinces in 1991, as shown in Porto and Cont (1998), benefit from regional redistribution according to the 2004 budget, although the comparison in 1991 excluded the city of Buenos Aires. Among the net receiving provinces, Neuquén, Chubut, Santa Cruz and Tierra del Fuego raise an important amount of provincial taxes to support their high per capita expenditure. The amount of the NC (net contribution) from the city of Buenos Aires to the group of provinces is significant: $1,814 per capita of the city (or 6% of its income), which turns out to be $155 per capita of the group of provinces (or 1.6% of their income).

Finally, the provincial expenditure creates a new ranking of provinces comparing ex ante and ex post per capita income. Some of them benefit from the mix provincial expenditure / redistribution (such is the case of Chaco, Formosa, Jujuy, La Rioja and Santiago del Estero, with an important expenditure and an even more important regional subsidy) while others are affected negatively (for example, Buenos Aires, Corrientes, Entre Ríos, Mendoza, Salta, San Juan and Tucumán, either because of a low expenditure, and negative or little positive redistribution effect). Other provinces do not improve significantly albeit a high expenditure and redistribution (Chaco or Jujuy).

Table 1 reports ex ante and ex post values for income distribution and per capita income. The net effect of provincial budgets on income distribution is a clear shift of income-value from high-income quintiles (4 and 5) to low-income quintiles (1 to 3), either including or excluding the city of Buenos Aires in the analysis.

Table 1: Ex ante and ex post income distribution and per capita income (quintiles), year 2004. Including and excluding the city of Buenos Aires. Values in pesos.

Income distribution (quintiles)	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5	Total
Income distribution (quintiles)						
Argentina						
. ex ante	3.7%	8.5%	14.0%	22.2%	51.6%	100%
. ex post	5.6%	10.0%	14.6%	22.0%	47.8%	100%
Argentina w/o city Bs As						
. ex ante	3.8%	8.6%	14.1%	22.3%	51.2%	100%
. ex post	5.9%	10.3%	14.8%	22.0%	47.0%	100%
Per capita income (pesos per quintil)						
Argentina						
. ex ante	2,187	4,986	8,190	12,989	30,178	11,710
. ex post	3,298	5,853	8,541	12,864	27,976	11,710
Argentina w/o city Bs As						
. ex ante	1,887	4,318	7,056	11,126	25,547	9,991
. ex post	2,989	5,220	7,510	11,186	23,806	10,146

Source: own elaboration. The ex ante income distribution aggregates households from the nth quintil in each province to constitute the nth quintil in Argentina. The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household lives.

Table A.2 in the Appendix summarizes the ex ante and ex post income distribution. Table A.3 reports the corresponding per capita income, and Table A.4 presents the change of per capita income due to provincial budget, all of them at the provincial level. The first clear result is a decrease in income for net financing jurisdictions. Second, in seven provinces (Chaco, Formosa, Jujuy, La Rioja, Misiones, Santa Cruz and Santiago del Estero) the richest quintil benefits from provincial expenditure and redistribution. Third, income of the fourth quintil decreases in net fi-

nancing provinces and Neuquén. Lastly, quintiles 1 to 3 are net beneficiaries from the provincial budget (with the exception of the 3rd quintil in the city of Buenos Aires).

4.3. The effect of provincial budget on inequality and welfare.

In this section we follow the standard methodology to assess the effect of provincial budget on income distribution. Table 2 summarizes the inequality coefficients for Argentina. Tables A.5 and A.6 in the Appendix show the details at the jurisdiction level.

Table 2: Inequality, progressivity and income redistribution. Argentina 2004.

Inequality indexes: Gini and Atkinson				
	Argentina		Argentina w/o city of Bs As	
	ex ante	ex post	e x ante	ex post
Gini	0.438	0.385	0.434	0.376
Atkinson ($\alpha = 0,5$)	0.161	0.122	0.158	0.116
Atkinson ($\alpha = -1$)	0.520	0.394	0.515	0.377
Atkinson ($\alpha = -10$)	0.780	0.669	0.778	0.654

Reynolds-Smolensky coefficient, and Kawani coefficients for expenditures and taxes		
Kg	0.481	0.463
g/(1- t+g)	0.127	0.145
Kt	-0.071	-0.069
t/(1-t+g)	0.127	0.129
RSp	-0.052	-0.058

The ex ante income distribution aggregates households from the nth quintil in each province to constitute the nth quintil in Argentina. The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household lives.

At the aggregate level, provincial budgets worked as a progressive redistributive tool, under all coefficients of measurement considered (Gini or Atkinson) and both including or excluding the city of Buenos Aires. For example, the Gini coefficient indicates a reduction of 0.05 points out of an inequality value of 0.438. The most important changes are observed in Catamarca, Chaco, Formosa, Jujuy, La Rioja, Santiago del Estero and Tucumán. The lowest changes are observed in the city and province of Buenos Aires and Mendoza (which are net

financing jurisdictions), but also in Santa Fe, Córdoba, Chubut, Neuquén and Santa Cruz.

The change in inequality measured by the Reynolds-Smolensky coefficient, is due to a strong effect from the expenditure side (high Kg), which more than overcomes the regressive effect of taxes collected to finance it. If the city of Buenos Aires is excluded an additional effect is given by NC, that is, the net contribution from this jurisdiction to the pool of provinces.

At the provincial level, the change in RSp is the result of an individual factor or a combination of factors. For example, in Mendoza it is the progressivity in expenditure but in Chaco, Formosa and La Rioja it is the significant size of expenditure. In Jujuy it is the combination of a high size in expenditure and a relatively neutral effect of taxes. The little change in the Gini of the city and province of Buenos is mainly due to a size effect (low expenditure vs. high revenues), while in Santa Cruz is mainly due to a redistribution effect (little progressive expenditure vs. regressive taxes). Finally, the little effect in San Luis is due to a low size in both expenditure and revenue.

Given the relevance of progressivity in expenditures in the results, Table A.7 in the Appendix reports the concentration index for several categories of expenditure. The aggregate level of expenditure is relatively proportional with significant differences among provinces and categories. Health, welfare and education categories are more progressive programs than justice, defense and economic services.

A final result is in order. In the case of net financing jurisdictions, there is a trade-off between the positive impact of fiscal budget on inequality and the negative "level effect" in average income. Table 3 assesses the net effect of fiscal budget using the Atkinson index of welfare for several assumptions on inequality-aversion for selected jurisdictions (we add the calculation for Argentina, with and without the city of Buenos Aires), and Table A.8 presents the results for all jurisdictions.

Table 3: Welfare assessment for selected jurisdictions.

Jurisdiction	Atkinson ($\alpha = 0.5$)		Atkinson ($\alpha = -1$)		Atkinson ($\alpha = -10$)	
	ex ante	ex post	ex ante	ex post	ex ante	ex post
City Bs As (CABA)	26,370	25,538	14,659	15,992	6,685	8,108
Buenos Aires	8,776	8,779	4,970	5,813	2,221	2,939
Mendoza	10,187	10,626	5,919	7,489	2,734	4,280
Argentina	9,823	10,283	5,618	7,096	2,569	3,873
Argentina w/o CABA	8,408	8,974	4,844	6,324	2,217	3,510

Source: own elaboration.

With the exception of the city of Buenos Aires, welfare increases in all provinces for the assumed values of α. Given that the exercise of provincial budget takes significant resources from the city of Buenos Aires, the level-effect loss in welfare is reverted under the assumption of significant inequality aversion. An easy calculation shows that the breakpoint value of α is 0.06. For the provinces of Buenos Aires and Mendoza, given the difference in ex ante and ex post average incomes, this will be the case for almost all values of α (the breakpoint value of α is 0.51 and 0.97, respectively). For the remaining provinces, the increase in welfare is the combination of net revenue received through coparticipation and progressiveness of the provincial budget. See, for example, the high increase in welfare in Formosa and Chaco (the two effects are in place) and the modest increase in welfare in Santa Fe and Córdoba (only the second effect is in place).

5. Results II: extensions.

As discussed in Section 3, besides the standard analysis of considering the interconnection between revenues and expenditures, interlinked with a regional distributive effect of the provincial budget, we considered four alternative exercises.

The first one (scenario 1) assumes a tax cost through an excess burden applied to different taxes. Using the results from Ballard *et al.* (1985), the burden ranges from 21% (production taxes) to 32% (property and consumption taxes). Scenario 2 considers that a fraction of expenditure on education and health spills over to the non-direct beneficiary households. We assume that 70% (60%) of expenditure in education (health) is allocated as in the standard case, that is, it goes to direct beneficiaries, and the remaining is allocated to households according to their initial income.[39] Scenario 3 considers the case of a leakage in expenditure. In this case we assume that 90% of total expenditure is distributed as in Section 4 and the remaining 10% is allocated to households according to their initial income. Finally, Scenario 4 includes the three effects together. Table 4 presents the results and Table A.9 in the Appendix reports the Gini coefficient for all simulations.

Compared to the base case from section 4, the assumed excess burden has little effect on income distribution but it has a negative level-effect in households' utility. When analyzing the composition of the inequality change, there is an increase in the tax size relative to the expenditure size, which has little effect due to the almost neutral (albeit regressive) tax system. If revenues were highly progressive or re-

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39. The assumption for education was taken from McMahon (2002) and the assumption for health was taken from Aaron and McGuire (1970).

gressive a significant effect should arise. In fact, this is the case of the provinces of Santa Cruz, Neuquén and Chubut (compare columns II and III in Table A.9), in which the impact on inequality of the provincial budget is reduced under the assumption of an excess burden because of a combination of higher tax size and highly regressive tax system.[40] Table A.9 also reports the Atkinson index of welfare for this scenario. Columns VII to IX reveal that the interaction of a positive impact of fiscal policy, the redistribution of revenues and the tax burden effect increases welfare less (or reduces welfare more) than under the no-tax burden scenario. In the case of the Buenos Aires province and Neuquén, welfare would be reduced for $\alpha=0.5$.

Table 4: Inequality, progressivity and income redistribution under selected scenarios.

	Ex ante	base	scenario 1	scenario 2	scenario 3	scenario 4
Inequality indexes: Gini and Atkinson						
		Ex post				
Gini	0.438	0.385	0.386	0.395	0.392	0.402
Atkinson (α =0,5)	0.161	0.122	0.122	0.129	0.126	0.133
Atkinson (α =-1)	0.520	0.394	0.397	0.416	0.408	0.432
Atkinson (α =-10)	0.781	0.669	0.673	0.691	0.683	0.707
Reynolds-Smolensky coefficient, and Kawani coefficients for expenditures and taxes						
Kg		0.481	0.481	0.406	0.433	0.365
g/(1-t+g)		0.127	0.131	0.126	0.127	0.130
Kt		-0.071	-0.071	-0.071	-0.071	-0.071
t/(1-t+g)		0.127	0.167	0.127	0.127	0.167
RSp		-0.052	-0.051	-0.042	-0.046	-0.036

Scenario 1: differential excess burden across taxes. Scenario 2: 70% of expenditure in education and 60% of expenditure in health is allocated as in the base case, and the remaining expenditure is allocated to households according to their initial income. Scenario 3: 90% of total expenditure is allocated as in the base case, and the remaining 10% is allocated to households according to their initial income. Scenario 4: Aggregation of Scenarios 1 to 3.

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40. This effect magnifies for higher excess burden.

The second scenario considers an externality in education and health expenditure that spreads over the households. This externality changes the impact of the provincial budget on inequality, depending on two main factors: the size and the composition of expenditure. At an aggregate level, there is a reduction in the positive effect on inequality and welfare from the previous section (base case in Table A.9), which is expected when part of expenditure is distributed in a less progressive way. At the level of jurisdictions, the lower positive effect is more noticeable in Chaco (high level of expenditure with average share of education and health), Santiago del Estero (high level of a highly progressive expenditure) and La Rioja (high expenditure level). The externality effect is very low in the city of Buenos Aires, the province of Buenos Aires, Santa Fe (all with a relatively low level of expenditure) and Santa Cruz (less progressive expenditure).

The third scenario is, in nature similar to the second one (see column V in Table A.9). The main difference is that the allocation (according to income) of a 10% of provincial expenditure, which is less progressive than education and health, implies a lower redistributive effect. In fact, at the country level the change in the Gini index is –0.046 (compared with the change of –0.042 in Scenario 2).

The fourth scenario is a compound of the previous three, and the result (a reduction of 0.036 in the Gini index) is straightforward once we know that the redistribution according to income of both total expenditure and the share of expenditure on education and health means a lower progressiveness of expenditure (the Kg coefficient decreases from 0.481 down to 0.365, a compound reduction of that in Scenarios 2 and 3) and that the excess burden assumption implies a stronger weight on regressive taxes.

6. Conclusions.

This paper studies the impact of provincial public budget on income distribution. The relevant two dimensions of income distribution, personal and regional, are captured in the analysis at the provincial level.

The redistributive effect of sub-national expenditures and taxes interact with the revenue-sharing regime. This interaction creates a trade-off between the positive effect on income distribution and (negative) regional net transfer in financing jurisdictions (the city of Buenos Aires, and the provinces of Buenos Aires and Mendoza), and reinforces the positive effect on income distribution in net-receiving provinces.

The size, progressivity, and distributive indicators, as well as the Atkinson's welfare indicator, show important differences among provinces. Provincial fiscal budget increases welfare in all provinces for the assumed inequality-aversion assump-

tions. However, there are significant differences in the provinces. For example, there is a significant increase in welfare in Chaco, Formosa, La Rioja and Santiago del Estero (they receive significant amounts of revenue through coparticipation and other transfers and their expenditure is very progressive), but a modest increase in welfare in Santa Fe and Córdoba (where the little benefit from coparticipation is the dominant effect). Two interesting cases are the city of Buenos Aires and the province of Buenos Aires: welfare is reduced if utility functions put little weight on inequality aversion. Neuquén enters this list when including excess burden on taxes.

We suggest taking into account several aspects widely discussed in theoretical papers, but less covered in empirical papers: externalities of some categories of expenditures, leakages in expenditures, and tax burden. The simulations run in this paper suggest that the first two effects weaken any positive impact of provincial fiscal budgets (if the leakage or externality is appropriated by medium to high income households). Tax burden creates more level effects than distributive effects (in particular, if the tax system is mildly regressive).

Finally, the methodology used in this paper can be extended to the national or consolidate budget. This is the subject of future research.

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Appendix.

The dataset consist of gross domestic product (taken from National Accounts), gross geographical product (taken from ECLAC) and public budget for the year 2004, from the National Bureau of Fiscal Coordination with Provinces, Secretariat of Treasury at the Ministry of Economics. The ex ante distribution of income is taken from CEDLAS-UNLP.

In order to determine the impact of taxes on different groups of households (classified into five income categories, according to provincial per capita household income), we use the following assumptions:

- Turnover, property and automobiles tax. We use the criteria presented in FIEL (1999), p. 361.
- Stamp taxes: 75% as property tax and 25% by population and income.
- Royalties: by population.

The taxes collected by the national government, which go back to provinces according to coparticipation or other transfer schemes, are distributed among the provinces in order to reflect the source of revenues. We use the assumptions made in FIEL (1999), p. 530. Then we assign taxes by quintiles using the criteria proposed by FIEL (1999), p. 361.

The source of information for expenditures is the 2004 budget execution by the provinces, taken from the National Bureau of Fiscal Coordination with Provinces, Secretariat of Treasury, at the Ministry of Economics.

For each category of provincial expenditure we allocate expenditure based on different sources of information and assumptions:

- General administration: per total expenditure.
- Justice: 50% per income and 50% per population.
- Transfers to local governments (municipalities): 35% according to use of urban services, 18% per users of the Public Health System, 8% by the distribution of welfare and the remainder is distributed evenly between population and the result of the previous allocation.
- Defense and Safety: 50% per income and 50% per population.
- Education: based on the number of students attending public schools.
- Culture, Science and Technology: per population.
- Health: based on the number of individuals who are not beneficiaries of a private health insurance program.
- Social security: per number of individuals that belong to the provincial social security system.
- Water and sewerage: 75% by users of the service and 25% by population.
- Housing: according to beneficiaries of loans for housing construction.
- Welfare: according to the number of beneficiaries of different welfare programs (nutrition, clothing, etc.).
- Work: per number of individuals unemployed.
- Other urban services: based on the use of urban services (paved roads, sewerage, public lighting and refuse collection).
- Primary production: among land owners.
- Energy, fuel and mining: according to consumption of energy and fuels.
- Industry: according to consumption of industrial products.

- Transport and communication services: 1/3 according to total consumption of goods, 1/3 according to expenditure on automobile and 1/3 according to tourism expenditures.
- Public Debt services: according to distribution of income.

The weight matrices B_n, T_n and X_n are available upon request.

Finally, as explained in the text, in most provinces the balance was a surplus even after deducting revenues from asset sales and property income. In these cases, we closed the balance, first, by deleting both revenue lines, and second, by increasing provincial expenditure proportionally by categories. In two provinces with provincial deficit (Formosa and Tucumán), we balanced the budget by increasing provincial taxes proportionally (in those provinces, asset sales and property income were irrelevant).

Table A.1: Gross geographical product, provincial public expenditure, and provincial and national (by province of source and destination) fiscal resources, per province. Year 2004.

	Jurisdiction	GGP ex ante $ per capita	Rkg	Provincial expenditure $ per capita	Rkg	Provincial expenditure % of GGP	Rkg	Total revenues (source) $ per capita	Rkg	Total revenues (source) % of GGP	Rkg	GGP ex post $ per capita	Rkg
1	City Bs As (CABA)	31,817	2	1,693.2	14	5.3%	24	3,507.0	4	11.0%	19	30,003	2
2	Buenos Aires	10,434	12	1,058.3	24	10.1%	23	1,448.9	9	13.9%	10	10,043	13
3	Catamarca	15,852	6	2,844.5	5	17.9%	18	1,183.0	12	7.5%	24	17,514	6
4	Córdoba	11,263	11	1,282.5	22	11.4%	22	1,215.2	11	10.8%	21	11,331	11
5	Corrientes	5,237	22	1,298.3	21	24.8%	9	585.5	22	11.2%	17	5,949	24
6	Chaco	5,251	21	1,678.9	15	32.0%	4	665.5	20	12.7%	13	6,264	19
7	Chubut	19,966	5	3,267.1	4	16.4%	19	3,199.7	5	16.0%	3	20,033	5
8	Entre Ríos	7,502	14	1,651.0	16	22.0%	11	1,075.3	13	14.3%	8	8,077	15
9	Formosa	4,377	24	2,195.5	9	50.2%	1	581.3	23	13.3%	12	5,991	23
10	Jujuy	5,725	18	1,709.3	12	29.9%	6	631.8	21	11.0%	18	6,802	16
11	La Pampa	13,083	7	2,590.2	7	19.8%	15	1,647.6	6	12.6%	14	14,025	7
12	La Rioja	6,353	15	2,843.3	6	44.8%	2	851.7	17	13.4%	11	8,344	14
13	Mendoza	12,089	8	1,427.1	18	11.8%	21	1,455.5	8	12.0%	15	12,060	9
14	Misiones	5,426	20	1,402.1	20	25.8%	8	775.6	18	14.3%	9	6,053	20
15	Neuquén	23,469	4	4,292.1	3	18.3%	17	4,110.1	3	17.5%	2	23,651	4
16	Río Negro	10,150	13	2,041.7	10	20.1%	14	1,620.0	7	16.0%	4	10,571	12
17	Salta	6,257	16	1,265.2	23	20.2%	13	724.3	19	11.6%	16	6,797	17
18	San Juan	5,756	17	1,720.7	11	29.9%	5	865.9	16	15.0%	6	6,610	18
19	San Luis	11,656	9	2,249.9	8	19.3%	16	1,063.9	14	9.1%	23	12,842	8
20	Santa Cruz	34,743	1	7,189.1	1	20.7%	12	5,206.8	1	15.0%	7	36,726	1
21	Santa Fe	11,616	10	1,424.9	19	12.3%	20	1,261.6	10	10.9%	20	11,779	10
22	Santiago del Estero	4,816	23	1,704.8	13	35.4%	3	478.6	24	9.9%	22	6,042	22
23	Tucumán	5,555	19	1,492.3	17	26.9%	7	1,004.2	15	18.1%	1	6,043	21
24	Tierra del Fuego	27,024	3	6,098.7	2	22.6%	10	4,110.8	2	15.2%	5	29,012	3
	Argentina	11,710		1,486.4		12.7%		1,486.4		12.7%		11,710	
	Argentina w/o CABA	9,991		1,468.7		14.7%		1,313.6		13.1%		10,146	
	Std. Dev.	8,847		1,529.2		10.5%		1,332.8		2.6%		8,761	
	Max/Min	7.9		6.8		9.4		10.9		2.4		6.2	

Source: Own estimates based on INDEC and Secretary of Treasury, Ministry of Economics. Rkg: ranking of provinces. 3 pesos= 1 US$.

Table A.1 (cont.): Gross geographical product, provincial public expenditure, and provincial and national (by province of source and destination) fiscal resources, per province. Year 2004.

Jurisdiction	Provincial revenues $ per capita	Rkg	Provincial revenues % of GGP	Rkg	National transfers (source) $ per capita	Rkg	National transfers (source) % of GGP	Rkg	National transfers (destination) $ per capita	Rkg	National transfers (destination) % of GGP	Rkg
1 City Bs As (CABA)	1,470.3	5	4.6%	17	2,036.7	1	6.4%	17	222.9	24	0.7%	24
2 Buenos Aires	588.6	10	5.6%	9	860.3	8	8.2%	7	469.6	23	4.5%	23
3 Catamarca	714.2	7	4.5%	18	468.8	17	3.0%	24	2,130.3	4	13.4%	14
4 Córdoba	412.9	15	3.7%	23	802.2	9	7.1%	12	869.5	15	7.7%	19
5 Corrientes	181.2	24	3.5%	24	404.3	20	7.7%	9	1,117.0	11	21.3%	7
6 Chaco	272.7	20	5.2%	13	392.9	21	7.5%	10	1,406.2	14	26.8%	4
7 Chubut	2,074.8	4	10.4%	3	1,124.9	3	5.6%	19	1,192.2	13	6.0%	21
8 Entre Ríos	424.3	14	5.7%	8	651.0	12	8.7%	3	1,226.7	13	16.4%	10
9 Formosa	214.6	22	4.9%	14	366.7	23	8.4%	6	1,980.9	5	45.3%	1
10 Jujuy	249.0	21	4.4%	20	382.7	22	6.7%	14	1,460.3	9	25.5%	5
11 La Pampa	695.3	8	5.3%	11	952.3	5	7.3%	11	1,894.8	6	14.5%	13
12 La Rioja	305.9	17	4.8%	15	545.7	15	8.6%	5	2,537.3	3	39.9%	2
13 Mendoza	664.0	9	5.5%	10	791.4	10	6.5%	16	763.0	22	6.3%	20
14 Misiones	331.6	16	6.1%	7	443.9	18	8.2%	8	1,070.4	17	19.7%	8
15 Neuquén	3,206.6	2	13.7%	1	903.5	6	3.8%	22	1,085.5	16	4.6%	22
16 Río Negro	744.0	6	7.3%	6	875.9	7	8.6%	4	1,297.6	12	12.8%	15
17 Salta	299.0	19	4.8%	16	425.2	19	6.8%	13	966.2	19	15.4%	11
18 San Juan	303.4	18	5.3%	12	562.5	13	9.8%	1	1,417.3	10	24.6%	6
19 San Luis	515.4	11	4.4%	19	548.5	14	4.7%	21	1,734.5	7	14.9%	12
20 Santa Cruz	4,083.2	1	11.8%	2	1,123.6	4	3.2%	23	3,106.0	2	8.9%	17
21 Santa Fe	499.3	13	4.3%	21	762.3	11	6.6%	15	925.7	20	8.0%	18
22 Santiago del Estero	192.7	23	4.0%	22	285.9	24	5.9%	18	1,512.1	8	31.4%	3
23 Tucumán	502.3	12	9.0%	5	501.9	16	9.0%	2	990.0	18	17.8%	9
24 Tierra del Fuego	2,695.8	3	10.0%	4	1,415.0	2	5.2%	20	3,403.0	1	12.6%	16
Argentina	651.3		5.6%		835.1		7.1%		835.1		7.1%	
Argentina w/o CABA	581.2		5.8%		732.4		7.3%		887.5		8.9%	
Std. Dev.	1,048.1		2.7%		400.0		1.8%		760.2		11.2%	
Max/Min	22.5		3.9		7.1		3.3		15.3		64.6	

Source: Own estimates based on INDEC and Secretary of Treasury, Ministry of Economics. Rkg: ranking of provinces. 3 pesos = 1US$.

Política fiscal y distribución personal y regional del ingreso en la Argentina

Table A.2: Income distribution by quintiles, pre and post provincial budget. Year 2004

	Jurisdiction	Quintil 1				Quintil 2				Quintil 3				Quintil 4				Quintil 5			
		Inc. ea	Rev.	Exp.	Inc. ep	Inc. ea	Rev.	Exp.	Inc. ep	Inc. ea	Rev.	Exp.	Inc. ep	Inc. ea	Rev.	Exp.	Inc. ep	Inc. ea	Rev.	Exp.	Inc. ep
1	City Bs As (CABA)	3.6	6.8	28.3	4.6	8.0	10.3	26.7	8.8	13.5	14.5	19.9	13.7	21.9	19.4	13.2	21.7	53.0	49.1	11.9	51.2
2	Buenos Aires	3.6	6.4	20.3	5.0	8.7	9.8	23.7	10.1	14.3	13.9	19.6	14.9	22.3	18.6	17.3	22.4	51.0	51.3	19.1	47.6
3	Catamarca	3.6	7.2	21.3	6.3	7.8	10.4	19.7	9.6	13.0	14.3	21.0	14.2	20.4	19.0	18.3	20.2	55.1	49.2	19.6	49.7
4	Córdoba	3.9	6.8	20.8	5.5	8.5	10.2	21.4	9.8	14.0	14.2	19.3	14.6	22.6	18.9	20.1	22.7	51.0	49.8	18.3	47.4
5	Corrientes	3.7	6.2	20.0	7.0	7.7	9.6	20.2	10.2	12.3	13.5	18.4	13.6	21.4	18.6	18.0	21.0	54.9	52.0	23.3	48.3
6	Chaco	4.2	6.8	20.7	8.4	8.2	10.2	21.9	11.6	12.6	14.4	19.6	14.3	20.5	19.3	17.2	19.8	54.4	49.4	20.5	45.9
7	Chubut	4.0	12.3	21.6	5.6	9.3	14.3	20.6	10.3	14.3	16.6	18.1	14.3	22.2	19.2	18.9	22.1	50.2	37.5	20.8	47.5
8	Entre Ríos	3.7	6.1	20.7	6.8	8.7	9.5	22.4	11.4	14.4	13.5	17.8	15.2	22.4	18.3	15.3	21.5	50.8	32.5	23.7	45.1
9	Formosa	3.6	7.5	16.7	8.0	8.0	10.7	17.9	11.4	13.4	14.7	20.2	15.7	19.9	18.9	19.9	20.0	55.0	48.1	25.3	44.8
10	Jujuy	4.4	6.4	21.7	8.5	8.5	9.8	20.3	11.3	13.3	13.9	19.4	14.8	21.3	18.8	18.7	20.9	52.5	51.1	19.9	44.4
11	La Pampa	3.5	7.1	22.5	6.6	9.0	10.4	21.5	11.2	15.2	14.5	21.2	16.4	23.2	19.1	18.7	20.9	49.0	48.9	16.0	42.9
12	La Rioja	5.0	6.1	23.9	11.3	9.1	9.5	21.9	13.4	13.5	13.6	19.4	15.5	21.5	18.6	17.3	20.4	51.0	52.1	17.6	39.5
13	Mendoza	3.9	8.5	27.1	6.0	8.7	11.3	21.7	9.9	14.1	14.8	17.4	14.4	22.3	18.8	16.4	22.1	51.1	46.5	17.4	47.7
14	Misiones	4.7	6.7	18.8	7.7	8.7	10.1	17.7	10.6	14.4	14.2	17.4	15.2	21.6	19.2	18.0	21.1	50.5	49.9	28.0	45.4
15	Neuquén	3.3	14.3	21.9	4.8	7.9	15.8	22.0	9.1	13.3	17.5	19.0	13.6	22.7	19.5	17.5	22.3	52.7	33.0	19.6	50.1
16	Río Negro	4.2	8.7	24.7	7.5	8.2	11.6	20.1	9.9	12.6	15.1	19.4	13.6	20.5	19.1	17.1	20.1	54.4	45.5	18.7	48.9
17	Salta	3.2	7.1	21.5	6.2	6.5	10.4	21.4	8.8	10.9	14.3	18.7	12.0	19.8	18.8	17.1	19.4	59.6	49.4	21.4	53.6
18	San Juan	4.1	6.3	23.2	8.8	8.6	9.7	20.6	11.6	13.9	13.8	18.6	15.1	20.4	18.6	17.8	20.0	53.0	51.6	19.8	44.5
19	San Luis	5.1	6.5	28.9	9.2	9.4	10.0	18.5	10.9	15.2	14.3	21.1	16.3	23.1	19.3	13.9	21.8	47.2	50.0	17.7	41.8
20	Santa Cruz	4.2	12.8	20.3	6.1	9.3	14.7	17.3	10.1	15.9	16.9	16.0	15.7	22.8	19.5	19.2	22.6	47.8	36.1	27.2	45.4
21	Santa Fe	3.9	6.7	22.5	5.8	9.3	10.2	22.4	10.7	15.1	14.1	18.4	15.6	23.5	18.8	17.5	23.3	48.3	50.2	19.2	44.6
22	Santiago del Estero	3.0	6.5	21.3	7.9	7.0	9.9	21.0	10.7	12.5	14.0	19.3	14.3	21.1	18.8	18.3	20.5	56.5	50.7	20.0	46.6
23	Tucumán	3.9	6.1	23.5	8.4	8.5	9.7	21.7	11.5	13.2	13.9	19.3	14.6	21.1	19.2	16.7	20.4	53.3	51.2	18.9	45.2
24	Tierra del Fuego	4.1	10.4	26.6	7.9	9.3	13.0	19.3	10.9	14.3	15.9	18.9	15.0	21.9	19.4	17.1	21.3	50.4	41.3	18.2	44.9
	Argentina	3.7	7.3	22.2	5.6	8.5	10.5	22.2	10.0	14.0	14.4	19.1	14.6	22.2	18.9	17.2	22.0	51.6	48.9	19.3	47.8
	Argentina w/o CABA	3.8	7.4	21.6	5.9	8.6	10.6	21.7	10.3	14.1	14.4	19.0	14.8	22.3	18.8	17.6	22.0	51.2	48.9	20.0	47.0

Source: own elaboration. ea: ex ante; ep: ex post; Inc: Income; Rev: Provincial revenues; Exp: Provincial expenditures.

Table A.3: Per capita income, before and after provincial budget. In Argentine pesos. Year 2004.

	Jurisdiction	Quintil 1 ea	Quintil 1 ep	Quintil 2 ea	Quintil 2 Ep	Quintil 3 ea	Quintil 3 ep	Quintil 4 ea	Quintil 4 ep	Quintil 5 ea	Quintil 5 ep	Total ea		Total ep	
1	City Bs As (CABA)	5,691	6,904	12,798	13,253	21,453	20,598	34,761	32,475	84,369	76,773	31,817	2	30,003	2
2	Buenos Aires	1,891	2,503	4,550	5,094	7,473	7,502	11,656	11,223	26,585	23,881	10,434	12	10,043	13
3	Catamarca	2,880	5,493	6,218	8,409	10,305	12,446	16,193	17,674	43,611	43,496	15,852	6	17,514	6
4	Córdoba	2,195	3,118	4,788	5,541	7,875	8,249	12,730	12,870	28,721	26,869	11,263	11	11,331	11
5	Corrientes	959	2,077	2,016	3,045	3,225	4,026	5,609	6,234	14,369	14,360	5,237	22	5,949	24
6	Chaco	1,117	2,632	2,142	3,645	3,314	4,481	5,397	6,204	14,259	14,337	5,251	21	6,264	19
7	Chubut	4,040	5,595	9,235	10,305	14,296	14,609	22,300	22,306	49,659	47,080	19,966	5	20,033	5
8	Entre Ríos	1,384	2,769	3,264	4,601	5,391	6,132	8,394	8,677	19,057	18,192	7,502	14	8,077	15
9	Formosa	799	2,411	1,761	3,417	2,924	4,711	4,362	6,001	12,022	13,398	4,377	24	5,991	23
10	Jujuy	1,262	2,913	2,424	3,844	3,821	5,044	6,095	7,099	15,014	15,105	5,725	18	6,802	16
11	La Pampa	2,303	4,639	5,908	7,834	9,972	11,527	15,203	16,054	31,977	30,029	13,083	7	14,025	7
12	La Rioja	1,582	4,721	2,878	5,583	4,271	6,444	6,845	8,514	16,169	16,445	6,353	15	8,344	14
13	Mendoza	2,328	3,646	5,235	5,955	8,497	8,658	13,511	13,310	30,853	28,715	12,089	8	12,060	9
14	Misiones	1,273	2,332	2,364	3,213	3,918	4,591	5,866	6,386	13,708	13,740	5,426	20	6,053	20
15	Neuquén	3,925	5,689	9,299	10,775	15,616	16,103	26,718	26,469	61,675	59,115	23,469	4	23,651	4
16	Río Negro	2,164	3,983	4,131	5,241	6,401	7,158	10,412	10,611	27,627	25,854	10,150	13	10,571	12
17	Salta	1,008	2,110	2,023	2,999	3,414	4,078	6,189	6,588	18,634	18,199	6,257	16	6,797	17
18	San Juan	1,184	2,913	2,487	3,839	3,986	4,988	5,889	6,612	15,205	14,676	5,756	17	6,610	18
19	San Luis	2,987	5,890	5,475	7,023	8,853	10,472	13,467	14,002	27,486	26,813	11,656	9	12,842	8
20	Santa Cruz	7,302	11,267	16,232	18,614	27,559	28,902	39,624	41,446	82,918	83,322	34,743	1	36,726	1
21	Santa Fe	2,243	3,423	5,376	6,328	8,740	9,160	13,642	13,707	28,066	26,268	11,616	10	11,779	10
22	Santiago del Estero	723	2,388	1,681	3,238	3,003	4,313	5,083	6,196	13,555	14,043	4,816	23	6,042	22
23	Tucumán	1,089	2,536	2,351	3,484	3,662	4,403	5,869	6,156	14,776	13,614	5,555	19	6,043	21
24	Tierra del Fuego	5,570	11,549	12,617	15,833	19,235	21,712	29,629	30,866	67,995	65,040	27,024	3	29,012	3

Source: own elaboration. ea: ex ante; ep: ex post. 3 pesos = 1 US$.

Table A.4: Change in per capita income. In Argentine pesos. Year 2004

	Jurisdiction	Quintil 1	Rkg	Quintil 2	Rkg	Quintil 3	Rkg	Quintil 4	Rkg	Quintil 5	Rkg	Total	Rkg
1	City Bs As (CABA)	1,213	18	456	24	-854	24	-2,286	24	-7,596	24	-1,814	24
2	Buenos Aires	612	24	544	23	29	23	-432	23	-2,704	22	-391	23
3	Catamarca	2,613	5	2,191	4	2,141	3	1,481	4	-115	9	1,662	4
4	Córdoba	922	23	753	21	374	20	140	18	-1,852	17	67	21
5	Corrientes	1,119	20	1,029	17	801	12	625	11	-9	8	713	12
6	Chaco	1,515	14	1,503	9	1,167	10	807	9	78	6	1,013	9
7	Chubut	1,555	13	1,069	16	313	21	6	20	-2,579	21	67	20
8	Entre Ríos	1,385	16	1,337	13	741	14	283	16	-865	13	576	14
9	Formosa	1,612	12	1,657	6	1,787	4	1,639	3	1,376	1	1,614	5
10	Jujuy	1,651	11	1,420	11	1,223	9	1,004	7	90	5	1,078	8
11	La Pampa	2,335	6	1,926	5	1,555	6	851	8	-1,948	18	943	10
12	La Rioja	3,139	3	2,705	2	2,173	2	1,669	2	276	4	1,992	1
13	Mendoza	1,318	17	720	22	161	22	-200	21	-2,139	19	-28	22
14	Misiones	1,059	22	849	20	673	16	520	13	32	7	626	13
15	Neuquén	1,764	8	1,476	10	487	18	-250	22	-2,560	20	182	18
16	Río Negro	1,820	7	1,109	15	756	13	199	17	-1,773	15	422	17
17	Salta	1,102	21	976	18	664	17	399	14	-435	10	541	15
18	San Juan	1,729	9	1,352	12	1,002	11	723	10	-528	11	855	11
19	San Luis	2,903	4	1,548	8	1,619	5	534	12	-673	12	1,186	7
20	Santa Cruz	3,965	2	2,383	3	1,342	7	1,823	1	404	3	1,982	3
21	Santa Fe	1,180	19	951	19	420	19	65	19	-1,798	16	163	19
22	Santiago del Estero	1,665	10	1,557	7	1,310	8	1,113	6	489	2	1,226	6
23	Tucumán	1,447	15	1,133	14	741	15	287	15	-1,162	14	488	16
24	Tierra del Fuego	5,979	1	3,216	1	2,477	1	1,238	5	-2,955	23	1,988	2

<u>Source</u>: own elaboration. Rkg: ranking of provinces. 3 pesos = 1 US$.

Table A.5: Gini and Atkinson coefficients of inequality. Year 2004

Jurisdiction	Gini				Atkinson (α = 0.5)				Atkinson (α = 1)				Atkinson (α = -10)			
	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg
1 City Bs As (CABA)	0.451	9	0.424	1	0.171	7	0.149	1	0.539	6	0.467	1	0.790	5	0.730	1
2 Buenos Aires	0.434	13	0.390	5	0.159	12	0.126	4	0.524	8	0.421	3	0.787	6	0.707	3
3 Catamarca	0.462	4	0.390	4	0.180	4	0.125	5	0.543	5	0.381	7	0.787	7	0.632	10
4 Córdoba	0.433	14	0.387	6	0.157	15	0.123	6	0.509	13	0.402	5	0.771	13	0.677	4
5 Corrientes	0.465	3	0.373	9	0.181	3	0.114	9	0.545	4	0.348	11	0.785	9	0.591	13
6 Chaco	0.451	7	0.333	18	0.170	8	0.092	18	0.504	14	0.280	19	0.750	19	0.509	20
7 Chubut	0.421	17	0.382	7	0.150	18	0.121	7	0.490	18	0.392	6	0.762	15	0.672	5
8 Entre Ríos	0.432	16	0.346	14	0.158	14	0.098	14	0.519	10	0.321	14	0.783	10	0.598	12
9 Formosa	0.459	5	0.329	20	0.178	5	0.089	20	0.538	7	0.281	18	0.786	8	0.529	18
10 Jujuy	0.436	12	0.325	21	0.158	13	0.086	21	0.485	19	0.271	21	0.741	21	0.500	21
11 La Pampa	0.421	18	0.337	16	0.151	17	0.093	16	0.523	9	0.322	13	0.793	4	0.612	11
12 La Rioja	0.418	21	0.253	24	0.144	22	0.054	24	0.446	23	0.173	24	0.708	23	0.349	24
13 Mendoza	0.433	15	0.382	8	0.157	16	0.119	8	0.510	12	0.379	8	0.774	11	0.645	7
14 Misiones	0.418	20	0.344	15	0.145	20	0.096	15	0.460	22	0.304	16	0.725	22	0.549	15
15 Neuquén	0.454	6	0.416	3	0.175	6	0.143	3	0.556	3	0.451	2	0.804	3	0.718	2
16 Río Negro	0.451	8	0.372	10	0.170	9	0.114	10	0.504	15	0.338	12	0.750	20	0.560	14
17 Salta	0.505	1	0.421	2	0.215	1	0.147	2	0.599	1	0.416	4	0.811	2	0.636	9
18 San Juan	0.438	11	0.319	22	0.161	11	0.084	22	0.499	16	0.261	22	0.758	16	0.486	22
19 San Luis	0.391	24	0.304	23	0.126	24	0.075	23	0.421	24	0.246	23	0.699	24	0.470	23
20 Santa Cruz	0.403	23	0.364	11	0.137	23	0.108	11	0.471	21	0.361	10	0.753	18	0.640	8
21 Santa Fe	0.413	22	0.361	12	0.144	21	0.107	12	0.497	17	0.367	9	0.773	12	0.659	6
22 Santiago del Estero	0.484	2	0.349	13	0.200	2	0.100	13	0.598	2	0.306	15	0.824	1	0.538	16
23 Tucumán	0.446	10	0.330	19	0.167	10	0.090	19	0.515	11	0.277	20	0.770	14	0.509	19
24 Tierra del Fuego	0.421	19	0.337	17	0.148	19	0.092	17	0.485	20	0.292	17	0.758	17	0.534	17

Source: own elaboration. Rkg: ranking of provinces

Table A.6: Reynolds-Smolensky (RSp), Kakwani for expenditure (Kg) and revenues (Kt). Year 2004.

Jurisdiction	Kg	Rkg	g/(1-t+g)	Rkg	Kt	Rkg	t/(1-t+g)	Rkg	RSp	Rkg
1 City Bs As (CABA)	0.636	1	0.056	24	-0.076	14	0.117	13	-0.027	24
2 Buenos Aires	0.469	15	0.105	23	-0.039	6	0.144	5	-0.044	20
3 Catamarca	0.482	12	0.162	19	-0.092	15	0.068	24	-0.072	16
4 Córdoba	0.459	17	0.113	22	-0.055	11	0.107	14	-0.046	19
5 Corrientes	0.447	19	0.218	9	-0.063	12	0.098	19	-0.091	8
6 Chaco	0.472	14	0.268	4	-0.074	13	0.106	17	-0.119	5
7 Chubut	0.436	21	0.163	18	-0.201	23	0.160	3	-0.039	21
8 Entre Ríos	0.437	20	0.204	11	-0.026	3	0.133	8	-0.086	10
9 Formosa	0.382	22	0.366	1	-0.101	18	0.097	20	-0.130	3
10 Jujuy	0.456	18	0.251	6	-0.043	8	0.093	21	-0.111	7
11 La Pampa	0.484	11	0.185	15	-0.052	10	0.117	12	-0.083	12
12 La Rioja	0.487	10	0.341	2	-0.013	2	0.102	18	-0.165	1
13 Mendoza	0.532	2	0.118	21	-0.099	17	0.121	11	-0.051	18
14 Misiones	0.343	23	0.232	8	-0.037	5	0.128	10	-0.075	15
15 Neuquén	0.490	9	0.181	16	-0.290	24	0.174	1	-0.039	22
16 Río Negro	0.511	4	0.193	13	-0.127	19	0.153	4	-0.079	14
17 Salta	0.523	3	0.186	14	-0.133	20	0.107	16	-0.083	13
18 San Juan	0.477	13	0.260	5	-0.039	7	0.131	9	-0.119	4
19 San Luis	0.500	7	0.175	17	-0.006	1	0.083	22	-0.087	9
20 Santa Cruz	0.340	24	0.196	12	-0.198	22	0.142	6	-0.038	23
21 Santa Fe	0.459	16	0.121	20	-0.031	4	0.107	15	-0.052	17
22 Santiago del Estero	0.507	5	0.282	3	-0.095	16	0.079	23	-0.135	2
23 Tucumán	0.503	6	0.247	7	-0.046	9	0.166	2	-0.116	6
24 Tierra del Fuego	0.498	8	0.210	10	-0.148	21	0.142	7	-0.084	11

Source: own elaboration. Rkg: ranking of provinces.

Table A.7: Concentration indexes, by category of expenditure. Year 2004.

Jurisdiction	Total expenditure	General administration	Justice	Defense and safety	Culture y education	Health	Economic services	Welfare programs	Others*
1 City Bs As (CABA)	-0.185	-0.230	0.226		-0.253	-0.289	0.309	-0.468	0.064
2 Buenos Aires	-0.035	-0.066	0.217	0.217	-0.158	-0.239	0.281	-0.332	0.044
3 Catamarca	-0.019	-0.059	0.231	0.231	-0.096	-0.313	0.252	-0.180	0.062
4 Córdoba	-0.026	-0.049	0.217	0.217	-0.198	-0.269	0.047	-0.332	0.110
5 Corrientes	0.018	-0.027	0.232	0.232	-0.121	-0.228	0.238	-0.344	0.120
6 Chaco	-0.020	-0.051	0.226	0.226	-0.120	-0.235	0.010	-0.344	0.132
7 Chubut	-0.013	-0.084	0.211	0.211	-0.081	-0.322	0.214	-0.530	-0.001
8 Entre Ríos	-0.004	-0.044	0.216	0.216	-0.187	-0.308	0.197	-0.354	0.198
9 Formosa	0.077	0.019	0.230	0.230	-0.046	-0.139	0.274	-0.040	0.110
10 Jujuy	-0.020	-0.063	0.218	0.218	-0.117	-0.266	0.088	-0.295	0.079
11 La Pampa	-0.063	-0.086	0.210	0.210	-0.137	-0.286	0.009	-0.407	0.000
12 La Rioja	-0.069	-0.113	0.209	0.209	-0.172	-0.276	0.246	-0.301	0.001
13 Mendoza	-0.099	-0.149	0.216	0.216	-0.252	-0.323	0.064	-0.529	0.036
14 Misiones	0.075	-0.009	0.209	0.209	-0.114	-0.221	0.250	-0.377	0.145
15 Neuquén	-0.036	-0.088	0.227	0.227	-0.058	-0.245	0.113	-0.361	-0.055
16 Río Negro	-0.059	-0.108	0.226	0.226	-0.128	-0.257	0.185	-0.518	0.022
17 Salta	-0.018	-0.065	0.252	0.252	-0.152	-0.249	0.174	-0.337	0.100
18 San Juan	-0.038	-0.094	0.219	0.219	-0.206	-0.279	0.253	-0.386	0.174
19 San Luis	-0.108	-0.149	0.196	0.196	-0.069	-0.274	0.303	-0.394	-0.210
20 Santa Cruz	0.063	-0.062	0.201	0.201	-0.108	-0.290	0.335	-0.484	0.053
21 Santa Fe	-0.046	-0.097	0.206	0.206	-0.168	-0.318	0.406	-0.354	0.022
22 Santiago del Estero	-0.022	-0.082	0.242	0.242	-0.142	-0.293	0.269	-0.390	0.092
23 Tucumán	-0.056	-0.092	0.223	0.223	-0.167	-0.327	0.170	-0.223	-0.013
24 Tierra del Fuego	-0.076	-0.111	0.210	0.210	-0.168	-0.316	0.188	-0.495	-0.039
Argentina	-0.043	-0.090	0.219	0.218	-0.163	-0.272	0.218	-0.366	0.053
Argentina w/o CABA	-0.029	-0.073	0.219	0.218	-0.154	-0.268	0.214	-0.349	0.053

Source: own elaboration. * Others pool expenditures on social security, water and sewerage, housing, work, other urban services, services of public debt and transfers to local governments (municipalities).

Table A.8: Welfare assessment for Argentine jurisdictions. In Argentine pesos. Year 2004

Jurisdiction	Atkinson (α=0.5)		Atkinson (α=−1)		Atkinson (α=−10)	
	ex ante	ex post	ex ante	Ex post	ex ante	ex post
1 City Bs As (CABA)	26,370	25,538	14,659	15,992	6,685	8,108
2 Buenos Aires	8,776	8,779	4,970	5,813	2,221	2,939
3 Catamarca	13,001	15,320	7,249	10,849	3,383	6,443
4 Córdoba	9,490	9,938	5,526	6,781	2,579	3,661
5 Corrientes	4,288	5,271	2,384	3,881	1,126	2,434
6 Chaco	4,360	5,689	2,605	4,511	1,311	3,078
7 Chubut	16,973	17,610	10,189	12,187	4,746	6,571
8 Entre Ríos	6,318	7,286	3,608	5,484	1,626	3,251
9 Formosa	3,600	5,459	2,021	4,307	938	2,823
10 Jujuy	4,821	6,214	2,946	4,957	1,482	3,400
11 La Pampa	11,102	12,723	6,244	9,514	2,706	5,446
12 La Rioja	5,437	7,893	3,517	6,902	1,858	5,430
13 Mendoza	10,187	10,626	5,919	7,489	2,734	4,280
14 Misiones	4,639	5,472	2,929	4,211	1,495	2,728
15 Neuquén	19,368	20,275	10,417	12,974	4,610	6,681
16 Río Negro	8,429	9,367	5,037	6,998	2,541	4,649
17 Salta	4,909	5,795	2,507	3,971	1,184	2,471
18 San Juan	4,829	6,054	2,885	4,885	1,390	3,399
19 San Luis	10,184	11,879	6,748	9,683	3,508	6,808
20 Santa Cruz	29,990	32,748	18,373	23,452	8,577	13,226
21 Santa Fe	9,940	10,523	5,847	7,459	2,635	4,020
22 Santiago del Estero	3,854	5,437	1,937	4,195	850	2,791
23 Tucumán	4,629	5,502	2,696	4,369	1,279	2,965
24 Tierra del Fuego	23,015	26,332	13,918	20,527	6,542	13,507
Argentina	9,823	10,283	5,618	7,096	2,569	3,873
Argentina w/o CABA	8,408	8,974	4,844	6,324	2,217	3,510

Source: own elaboration. 3 pesos = 1 US$.

Table A.9: Change in Gini coefficient of inequality and Atkinson index of welfare under several alternative scenarios.

Jurisdiction	Gini (ex ante)	Gini (ex post)					Atkinson index of welfare (α=0.5)		
		Base	scenario 1	scenario 2	scenario 3	scenario 4	ex ante	Base	scenario 1
1 City Bs As (CABA)	0.451	0.424	0.426	0.431	0.428	0.437	26,370	25,538	24,679
2 Buenos Aires	0.434	0.390	0.390	0.398	0.395	0.403	8,776	8,779	8,438
3 Catamarca	0.462	0.390	0.390	0.400	0.398	0.407	13,001	15,320	15,040
4 Córdoba	0.433	0.387	0.388	0.395	0.392	0.400	9,490	9,938	9,639
5 Corrientes	0.465	0.373	0.373	0.388	0.383	0.397	4,288	5,271	5,130
6 Chaco	0.451	0.333	0.331	0.350	0.345	0.361	4,360	5,689	5,526
7 Chubut	0.421	0.382	0.388	0.393	0.390	0.406	16,973	17,610	16,850
8 Entre Ríos	0.432	0.346	0.344	0.363	0.355	0.369	6,318	7,286	7,030
9 Formosa	0.459	0.329	0.328	0.346	0.343	0.358	3,600	5,459	5,318
10 Jujuy	0.436	0.325	0.324	0.343	0.337	0.352	4,821	6,214	6,062
11 La Pampa	0.421	0.337	0.336	0.349	0.346	0.357	11,102	12,723	12,323
12 La Rioja	0.418	0.253	0.249	0.274	0.270	0.286	5,437	7,893	7,688
13 Mendoza	0.433	0.382	0.383	0.392	0.388	0.399	10,187	10,626	10,281
14 Misiones	0.418	0.344	0.342	0.355	0.352	0.361	4,639	5,472	5,284
15 Neuquén	0.454	0.416	0.426	0.427	0.424	0.446	19,368	20,275	19,284
16 Río Negro	0.451	0.372	0.374	0.386	0.382	0.397	8,429	9,367	8,978
17 Salta	0.505	0.421	0.423	0.437	0.431	0.447	4,909	5,795	5,626
18 San Juan	0.438	0.319	0.316	0.341	0.332	0.350	4,829	6,054	5,847
19 San Luis	0.391	0.304	0.303	0.314	0.313	0.321	10,184	11,879	11,624
20 Santa Cruz	0.403	0.364	0.369	0.373	0.371	0.384	29,990	32,748	31,533
21 Santa Fe	0.413	0.361	0.360	0.370	0.366	0.375	9,940	10,523	10,221
22 Santiago del Estero	0.484	0.349	0.348	0.374	0.363	0.386	3,854	5,437	5,324
23 Tucumán	0.446	0.330	0.326	0.345	0.342	0.354	4,629	5,502	5,258
24 Tierra del Fuego	0.421	0.337	0.339	0.352	0.347	0.363	23,015	26,332	25,382
Argentina	0.438	0.385	0.386	0.395	0.392	0.402	9,823	10,283	9,928
Argentina w/o CABA	0.434	0.376	0.376	0.386	0.382	0.393	8,408	8,974	8,662

Source: own elaboration. Scenario 1: differential excess burden across taxes. Scenario 2: 70% of expenditure in education and 60% of expenditure in health is allocated as in the base case, and the remaining expenditure is allocated to households according to their initial income. Scenario 3: 90% of total expenditure is allocated as in the base case, and the remaining 10% is allocated to households according to their initial income. Scenario 4: Aggregation of Scenarios 1 to 3.

Personal and Regional Redistribution through the National Budget in Argentina. 2004.

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Resumen.

En un sistema federal, la distribución del ingreso es afectada por la política fiscal de los distintos niveles de gobierno en al menos dos dimensiones: personal y regional. En este trabajo se estudia el impacto del presupuesto nacional (que representa el 46% de los gastos y el 76% de los recursos fiscales) sobre la distribución del ingreso en la Argentina para el año 2004.

A través del presupuesto público -impuestos y gastos- las decisiones del gobierno nacional impactan en la distribución personal del ingreso y también en la distribución regional. Este trabajo revela la importancia de considerar el impacto de la política fiscal sobre la distribución del ingreso a nivel provincial, dado que efectos son diferentes por jurisdicción. La agregación oculta las diferencias interprovinciales ya que hay provincias ganadoras y perdedoras en la distribución territorial de los gastos e impuestos nacionales.

Los principales resultados son que el presupuesto nacional tiene impacto positivo sobre la distribución personal del ingreso tanto a nivel agregado como de cada jurisdicción provincial. El impacto positivo es el efecto neto de gastos progresivos e impuestos regresivos. Los impactos son diferentes a nivel de provincias: por ejemplo, en ocho provincias aquéllas perdedoras netas en la redistribución regional el efecto progresivo del presupuesto sobre la distribución personal del ingreso entra en conflicto con el efecto negativo sobre la distribución personal, de modo que el cambio en el bienestar puede ser negativo para funciones de bienestar con un coeficiente pequeño de aversión a la desigualdad.

De una comparación con los resultados de un trabajo relacionado, se observa que no hay incompatibilidad entre los efectos redistributivos de los presupuestos nacional y provinciales.

JEL Code: H7, I3

Abstract.

In a federal system, income distribution is affected by the decision of many public economic agents in at least two dimensions: personal and regional. This paper studies the impact of the national budget (which represents around 46% of total public expenditures and around 76% of revenues) on the distribution of income in Argentina using budget information for year 2004.

Through public budgeting -expenditures and taxes- the national government typically affects the personal distribution of income, and also the regional distribution of income. This paper reveals the importance of considering the impact of fiscal policy on income distribution at the level of each province, because effects are different by jurisdiction. Some province may be winner or loser in the regional distribution through the national budget, and in the second case this result trades off against progressive budgets.

The main results of the paper are summarized as follows. Both at the aggregate and provincial levels the national budget has positive impact on the personal income distribution. The positive impact is the net result of progressive expenditures and regressive of taxes. However, the impacts differ by province: in eight provinces –those losers in the regional redistribution– the progressive effect on personal income trades off the negative effect on regional income in such a way that the welfare change may be negative for low levels of inequality aversion.

A comparison with results from a companion paper shows that there is no incompatibility between the redistributive effects of national and provincial budgets.

1. Introduction.

In a federal system, income distribution is affected by taxes, expenditures and intergovernmental transfers of the national and sub-national governments.

Most research in this field focuses on the impact of public budget on either personal or regional distribution of income. Very few papers integrate both effects. This paper studies the impact of the national government budget on the distribution of income using budget information for year 2004,[41] considering the allocation of expenditures and taxes at regional (provinces) and personal (quintiles) levels. National expenditures represent around 46% of consolidated public expenditure,

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41. We approximate the solution to the impact of national fiscal policy on income distribution as the estimation, for each income group, of the income before and after fiscal policy, both at the same existing equilibrium.

and national taxes represent 76% of total taxes (nation and provinces) in Argentina.

The main results of the paper are summarized as follows. At the aggregate level, the national budget has positive impact on the personal income distribution. The positive impact results from a combination of progressive expenditures and regressive taxes. Theses impacts are different at the level of each province. In eight provinces the difference between expenditures and taxes is negative (notably in Chubut, Tierra del Fuego, Neuquén, Santa Fe and Santa Cruz), so that they are losers or net financers in the regional redistribution. The net effect of national budget on personal distribution, however, is positive for all the provinces. Therefore, in the case of net-financing provinces, regional distribution trades off against personal distribution: the net effect, summarized by the Atkinson index of welfare, is also positive, except for very Benthamian welfare functions in Chubut, Tierra del Fuego, Neuquén and Santa Fe.

Results are compared with those that arise from provincial budgets for the same year, which were analyzed in the companion paper Cont, Peluffo and Porto (2009). We do not find incompatibility between the redistributive effects of national and provincial budgets.

The paper is organized as follows. In Section 2, we put the paper in context. In Section 3, we provide the basic definitions and the methodological framework. Section 4 presents the main results. Finally, Section 5 concludes.

2. Context.

Income distribution has been, from both a theoretical and historical perspective, one of the most intense research areas in economics. Research has been divided in positive approach, i.e., the study of the laws of income distribution in a capitalist economy, and normative approach, i.e., the study of the instruments to modify such distribution following some value judgment.

In the normative approach, the relevance of income distribution evolved along two variants (Musgrave, 1996). In the "service state", which establishes that the main role of the state is to allow the proper function of the market economy by providing a legal system, protection to society from foreign aggressions, public works that –because of size– cannot be provided by the private sector and the basic education to the poor, the tax principles according to benefits and ability to pay were assumed to coincide, so that the distributional impact of fiscal policy would be neutral. Instead, in the "welfare state", one of the functions of the government is to correct the income distribution which results from market forces.

Several questions arose about redistributive policy. A first question regarded the level of government that should be responsible for the income distribution task in a federal (multilevel) public sector: national, provincial or local, or all of them,

in which case a second question would be how to share this responsibility. The early answer to both questions was clear. Musgrave (1959) and Oates (1972) concluded that the central theme of fiscal federalism is found in the proposition that the provision of services should be assigned among the different levels of government, but the stabilization and distribution branches should be concentrated at the national level. According to this point of view allowing redistribution at sub-national level has two problems (Tresch, 2002). One arises from the mobility of people. Rich people have an incentive to move to other jurisdictions with lower taxes and poor people have an incentive to move to jurisdictions with higher benefits. These migrations tend to frustrate the redistribution at the cost of a lower per capita income (this is the "competition problem"). The other problem is the incompatibilities that can arise, even without mobility, when more than one level of government redistributes income (the "incompatibility problem"). "Suppose local government L wants to effect a redistribution from citizens in group A to citizens in group B, but the national government prefers a net redistribution from group B to group A. One can imagine and endless chain of redistributions as each government tries to have its way. Of course, this sort of game must be ruled out, and the most obvious way is to deny one government the right to redistribute" (Tresch, 2002, p. 842).

A third question regarded the relevant dimension of distribution: Should the aim of the public policy be the regional distribution of income, the personal distribution or both? The answer in this case was that personal distribution of income should be the matter of concern, because the arguments included in the welfare function are individuals' utilities. Moreover, there was recognition of a possible failure in the regional distribution principle. In particular, it could be the case that regional redistribution could generate a result in which rich people from poor regions be subsidized by poor people from rich regions. In this paper the focus is put on the impact of national budget on income distribution considering both dimensions of the problem, regional and personal.

Finally, a fourth dimension regards whether fiscal policies by different levels of governments complement or conflict each other. In other words, is there a problem of compatibility or incompatibility between national and provincial public budgets? We address these issues in the next two sections.

3. Methodology.

We follow the traditional methodology of benefit-incidence analysis from, among others, Musgrave and Thin (1948), Musgrave (1964), and Reynolds-Smolensky (1977). We apply the methodology to national public budget in several steps. First, we must provide an ordering of individuals according to a measure of *ex ante* income distribution (that is, income before national fiscal budget). Second,

we must identify and distribute both national expenditures and revenues to each individual or group of income in each province.[42] Third, the *ex post* income is the initial income after adding expenditure benefits and deducting net taxes. The final step is the comparison between the *ex ante* and *ex post* distributions of income, i.e., those before and after national fiscal policy, with some methodology. Given that the objective of this paper is to study the impact of national fiscal policy on regional and personal distribution of income, we use the Gini index of inequality, the Atkinson index of inequality, and the calculation of the welfare level in each province by using the Atkinson index of welfare.

3.1. Income and distribution of income.

We present income distribution in each province by dividing households into five groups (quintiles) of population. We take the distribution of per capita household income from the Permanent Household Survey (*Encuesta Permanente de Hogares*), or PHS, published by the National Bureau of Statistics (INDEC) for year 2004 (average of for quarterly surveys), and expand the reported incomes by a factor such that the total income from the PHS equals the Gross Domestic Product (GDP, which equals \$11,700, or approximately US\$3,900, per capita).[43] We allocate the GDP by jurisdiction according to Gross Geographical Product (GGP) estimates by ECLAC, in order to determine total group income in each province. Finally, we divide the expanded income by group population to determine per capita income by quintiles in each province, which is the starting point to assess income distribution.[44] Table A.1 in the Appendix presents the per capita income and income distribution in each province. Differently from the mainstream in income distribution analysis, we do not correct this income by equivalent adult. The main reason is the purpose of the study, which adds expenditures and taxes to get an ex post income.[45]

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42. We exclude national taxes that finance the revenue sharing system (coparticipation) and transfers to provinces.

43. We report the information in domestic currency (argentine pesos). The exchange rate to the US dollar was around \$3/dollar in year 2004.

44. Throughout the paper we treat gross product and ex ante income as the same. There is a significant difference between them depending on the subject under study. In this case, we consider it appropriate to use both GDP and GGP as measures of ex ante income because we deduct taxes and add expenditures to obtain ex post income. In others cases, it may be more appropriate to use a definition of household net income (that is, after taxes and subsidies).

45. This kind of correction may lead us to take many other factors into consideration, such as, for example, how to convert a peso spent in public administration or education by "equivalent beneficiary", in addition to all the assumptions done to distribute such expenditures following a benefit principle.
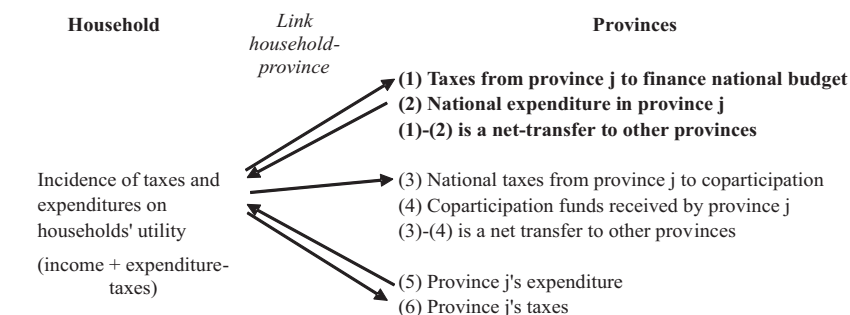
3.2. National budget and its distribution

We concentrate on national budget, which represents around 46% of nation-province consolidated public expenditures and 76% of taxes, excluding social security according to data from the Secretariat of Treasury. The reason to exclude the social security system is that these payments are, in a significant part, devolution of previous beneficiary contributions. Additionally, the location of the beneficiaries is not a policy variable. The redistributive impact of the system is beyond the scope of this paper. The national budget ended with a surplus in year 2004, and we made changes to make it balance, following a principle that current taxes will be spent in the future (distributed by categories as in the year under study) and that current deficits will be closed by future taxes (according to the same tax scheme as in the year under study).[46] This assumption introduces a conflict in the interpretation of debt services as a public expenditure with distributional impact, and therefore it is also excluded from the analysis.[47] Statistics for national expenditure and revenues are reported in Table A.2 and explained in the Appendix.

Figure 1 may be helpful to understand the fiscal flows at the provincial level. The national government spends funds in, and collects taxes from, each province and household (flows (1) and (2) in the Figure), redistributing resources both at personal and geographical dimensions. The effect of provincial budgets on regional and personal income distribution, through the interaction of (3) to (6) in Figure 1, is left aside in this paper (see Cont, Peluffo and Porto, 2009).

As a final step, we calculate an *ex post* income. By following the standard procedure, the allocation of expenditures and taxes among quintiles in the provinces exhaust the national budget (that is, we assume neither debt nor surplus).

Figure 1: Source and destination of funds at provincial level

Household	Link household-province	Provinces

(1) Taxes from province j to finance national budget
(2) National expenditure in province j
(1)-(2) is a net-transfer to other provinces

Incidence of taxes and expenditures on households' utility

(income + expenditure-taxes)

(3) National taxes from province j to coparticipation
(4) Coparticipation funds received by province j
(3)-(4) is a net transfer to other provinces

(5) Province j's expenditure
(6) Province j's taxes

46. Specifically, we for the year 2004 increased expenditure proportionally across provinces and categories after having consolidated coparticipation taxes between the national government and provinces.

47. There are two plausible reasons to exclude public debt services. *(continúa en la página siguiente).*

3.3. Conceptual framework for measurement.

The measurement of the impact of national fiscal policy on income distribution can be done as a standard comparative statics exercise between ex ante and ex post income distributions, where the ex post income is the ex ante income plus national expenditure less national taxes, for every household in each province.[48]

Formally, consider a province n with i households (labeled $n = 1,…, N$ and $i = 1,…, I,$ respectively). For simplicity, $I = 5$ and $N = 24$ reflect the case of quintiles in the Argentine provinces (included the city of Buenos Aires). Let m_{in} be the individual income before national fiscal policy, g_{in} the total benefits that household i obtained from the national expenditure in province n, and t_{in} the total taxes that household i paid in n to finance the national expenditure (i.e., excluding national taxes to finance provincial expenditures). The ex post individual income is

$$c_{in} = m_{in} + g_{in} - t_{in} \qquad (1)$$

National expenditure in province n is $g_n = \Sigma_k g_{kn}$, i.e., the sum of expenditures in k categories (defense, education, health, administration, etc.). Each expenditure k is distributed among households according to weights $_{ik}$, so that $g_{in} = \Sigma_k{}_{ik} \cdot g_{kn}$. A household i in province n pays r national taxes (VAT, consumption, income, etc., labeled t_r), according to weights $\tau_{ir,n}$. Therefore, $t_{in} = \Sigma_r \tau_{ir,n} \cdot t_r$. The i×k matrix labeled B summarizes the national expenditure weights; the i×r matrix T summarizes the national tax weights. Each column in B and T adds up to unity. Using these definitions, equation (1) can be rewritten as

$$c_{in} = m_{in} + \Sigma_k{}_{ik} \cdot g_{kn} - \Sigma_r \tau_{ir,n} \cdot t_r \qquad (2)$$

The budget constraint for the national government is

$$\Sigma_n \Sigma_k g_{kn} = \Sigma_r t_r \qquad (3)$$

Let $d_n = \Sigma_k g_{kn} - \Sigma_r \Sigma_i \tau_{ir,n} \cdot t_r$ represent the regional redistribution among provinces. At a provincial level the term d_n may be positive or negative. A positive residual means that the province receives a net transfer from the other provinces (that is, it is a "net receiver" through the national budget), while a negative residual means that the province finances the other provinces (that is, it is a "net financer" or "net

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47. *(continuacion de la página anterior).* The first one is that the concept of beneficiaries differs significantly from the other expenditure categories (receiver of a payment vs. receiver of a benefit). The second one is that, in case of considering the direct beneficiaries of debt interests, it is not clear whether they reside in the country or abroad. It must be recalled that, following the methodology of this paper, these services correspond to a certain debt issued in the past, which was used to finance some particular expenditure, and that in the year under study additional taxes were collected to pay for such services.

48. Part of this framework is adapted from Ahumada et al. (1996).

contributor" through the national budget).

When analyzing income distribution, we will use taxes and expenditures from equations (2) and (3) to calculate Gini coefficients of income inequality. For a given jurisdiction, this coefficient is calculated as

$$G = 1 + \frac{1}{I} - 2\sum_{i=1}^{I} \frac{(I + 1 - i)y_i}{I^2 y^P} \tag{4}$$

where income groups are ranked from lowest *(i = 1)* to highest *(i = 5)*. $I = 5$, given that we work with quintiles, $y = m, c$ (that is, ex ante or ex post income), and y^P is the average income of the group under analysis. To assess the impact of the national fiscal policy on income distribution we use the Reynolds and Smolensky (1977) indicator (*RSp*). The application of this indicator to the aggregate of *N* jurisdictions is

$$RSp = - t\ (Kt + Kg)$$

where *t* is the relative size of taxes (taxes / GGP), which equals the relative size of expenditures (expenditure / GGP), labeled *g*; *Kt* and *Kg* are the Kakwani (1977) progressivity indexes of taxes (equal to the difference between the concentration of taxes and (4)) and expenditures (equal to the difference between (4) and the concentration of expenditures). For a particular province, the *RS*p is

$$RSp = -\left(\frac{t}{1 - t + g} Kt + \frac{g}{1 - t + g} Kg \right) \tag{5}$$

where *t* may differ from *g* because the province is a net financer or a net receiver through the national budget.

We are also interested in the distinction between the regional and personal distribution of income. For that reason, we also calculate the (ex ante and ex post) Atkinson index and evaluate significant differences with the Gini coefficient. The Atkinson index is defined as

$$D(\alpha) = 1 - \frac{y^*}{y^P}, \quad \text{where} \quad y^* = \left(\frac{1}{I} \sum_{i=1}^{I} y_i^\alpha \right)^{1/\alpha} \tag{6}$$

where α is the inequality aversion coefficient, which takes values less than or equal to 1 (with a corresponding transformation if $\alpha = 0$). To focus on the welfare effect of fiscal policy, we calculate the net effect using a per-capita Atkinson-like welfare function.

$$W(...y_i...) = \left(\sum_{i=1}^{I} y_i^\alpha \right)^{1/\alpha} = (1 - D(\alpha)) y^P \tag{7}$$

where $y = c, m$ and the sum of weighted incomes corresponds to households in a province or in a country.

Many issues arise from a comparison of equations (2) and (3) and their application to (4)-(7). First, they reveal the importance of considering the regional factor in an analysis of impact of the national public budget on income distribution, not only because each region may have different ex ante income, but also because they may have their own incidence patterns for national taxes and expenditures, in addition to different level and mix of expenditures (g_n), taxes (t_n), and the position of net financer ($d_n < 0$) or net receiver ($d_n > 0$) through national budget.

Second, a full analysis of equation (2) must include all expenditures and taxes to assess the impact of national budget on income distribution. After the rupture of the principle of coincidence between benefit and ability to pay, both theoretical and empirical studies engaged in a first stage of partial analysis (biased to taxes), but later it was recognized that the tax and expenditure problems could not be treated separately. From the distributional standpoint, it is of little worth to count with a progressive expenditure if it is financed with very regressive taxes. Along the same lines, a social expenditure (the focus of many research papers on public policy and income distribution) may be progressive but total expenditure may be regressive, turning the partial analysis incomplete and misleading. In fact, the theory of state failure visualizes that expenditures, or a share of them, are tilted towards groups that take over the fiscal apparatus. Although it is difficult to quantify this effect beyond ad hoc assumptions on leakages, the inclusion of all expenditures –with their own distribution pattern– may help to understand the problem in a more complete way. For the same reasons it is necessary to include all taxes (legislated and non-legislated) since the tax structure (tax base, deductions, exemptions, and tax rates) are the result of a political-economics equilibrium.

Following Musgrave (1964) in the consideration of both sides of the budget (that is, the inclusion of all expenditures and taxes that enter equations (2) and (3)), we must identify first the taxes and expenditures for the *level of government* under research (national government in this paper). Then we must consider the *regional dimension*, because personal income, taxes and expenditures are not uniformly distributed across regions.

In sum, this paper estimates the impact of national budget on income distribution following the standard literature, calculating some of the typical progressivity indexes for expenditures, taxes and distributional impact. Then, it advances in two directions, usually omitted by the standard literature: (i) the consideration of both sides of the budget for the level of government considered –national, in this case–, revenues and expenditure; (ii) the consideration of the regional impact of national budget.

Figure 2: National expenditure and revenues (by source) and residual, as percentage of provincial income, year 2004.
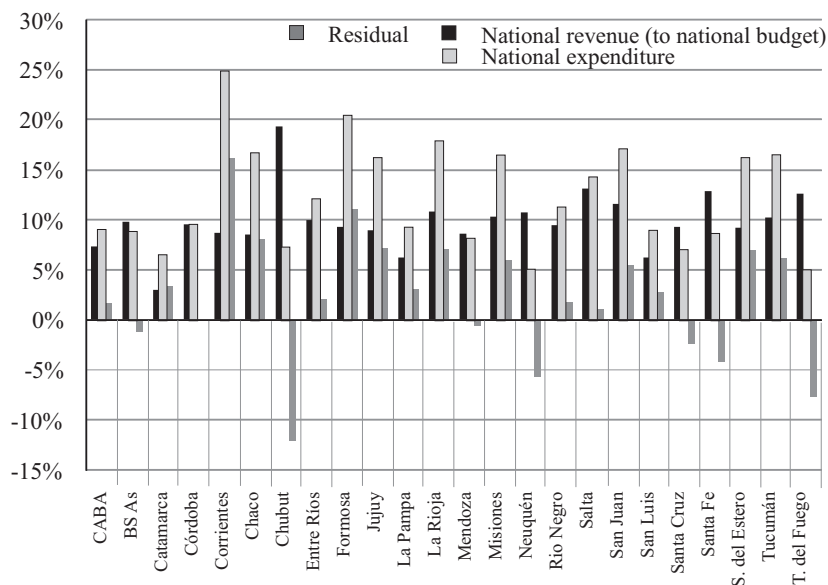
4. Results.

4.1. Preliminaries.

Tables A.1 and A.2 in the Appendix summarize average income, national expenditures and revenues (in this case, those necessary to finance national expenditure). Figure 2 shows expenditure and taxes as a share of provincial income. Provinces in Argentina are different in many dimensions. For an average per capita income of $11,710, the richest province's per capita income (Santa Cruz, with $34,743) is almost eight times the poorest one (Formosa, with $4,377). These differences are also present in expenditures and revenues. National expenditure allocated by province ranges from more than 20% of provincial income (in Corrientes and Formosa) to 5% of provincial income (in Tierra del Fuego and Neuquén). From the revenue side, Chubut outstands with a burden of 20% of income, followed by Tierra del Fuego, Salta and Santa Fe, with a burden of nearly 13% of income.

Eight jurisdictions (Chubut, Tierra del Fuego, Neuquén, Santa Fe, Santa Cruz, and to a little extent Buenos Aires, Mendoza and Córdoba) are identified as net financers. In the city of Buenos Aires revenue collection is high but expenditures

are higher, because some local public expenditure is provided by the national government. Only in three provinces the (absolute value of the) residual exceeds 10% of provincial income in Chubut (negative), Corrientes and Formosa (positive).

Finally, the national expenditure creates a new ranking of provinces comparing ex ante and ex post per capita income. Most remarkable changes produced in Corrientes (goes up four positions) and San Juan (goes down two positions). The national budget moves eight provinces in just one position (Table A.4).

4.2. The effect of provincial fiscal policy on income distribution.

Figure 3 reports ex ante and ex post values for income distribution and per capita income at the national level, while Tables A.3 and A.4 present the same information at the provincial level.

Figure 3: Effects of national fiscal policy. Ex ante and ex post income distribution and per capita income (quintiles), year 2004

Income distribution (quintiles)	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5	Total
Income distribution (quintiles) in percent of 100						
Argentina						
. ex ante	3.0	6.6	11.3	22.7	56.4	100
. ex post	3.9	7.3	11.9	23.0	53.9	100
- difference due to national budget	0.9	0.6	0.6	0.4	-2.4	
Per capita income (pesos per quintil)						
Argentina						
. ex ante	1,780	4,043	6,816	12,363	32,764	11,710
. ex post	2,300	4,415	7,165	12,554	31,360	11,710
- difference due to national budget	520	371	349	191	-1,403	

<u>Source</u>: own elaboration. The ex ante income distribution aggregates households from the nth quintil in Argentina (mixing different quintiles from different provinces). The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household resides.

The net effect of national budget on income distribution is a clear shift of income-value from the highest-income quintil (that is, most households in provincial 5th -quintil and some households in provincial 4th-quintil) to lower-income quintiles.

As mentioned before, at the provincial level, the redistribution through the na-

tional budget has a net positive (negative) effect in sixteen (eigth) provinces. Quintiles 1st to 3rd are better off in all provinces. The 4th is worse off in only three jurisdictions (city of Buenos Aires, Chubut and Río Negro). In seventeen provinces the national budget reduces their per capita income.

4.3. The effect of national budget on inequality and welfare.

In this section we follow the standard methodology to assess the effect of national budget on inequality and welfare. Figure 4 summarizes the inequality coefficients for Argentina, and Tables A.5 and A.6 in the Appendix show the details at the jurisdiction level.

At the aggregate level, the national budget is a progressive redistributive tool, under all coefficients of measurement considered (Gini or Atkinson). For example, the Gini coefficient indicates a reduction of 0.03 points out of an inequality value of 0.496.

The change in inequality, measured by the Reynolds-Smolensky coefficient, is due to a strong effect from the expenditure side (high K_g), which more than overcomes the regressive effect of taxes (negative K_t) collected to finance it.

Figure 4: Inequality, progressivity and income redistribution.
Argentina 2004.

Inequality indexes, Gini and Atkinson		
	ex ante	ex post
Gini	0.496	0.468
Atkinson ($\alpha = 0,5$)	0.211	0.186
Atkinson ($\alpha = -1$)	0.600	0.532
Atkinson ($\alpha = -10$)	0.821	0.769
Reynolds-Smolensky coefficient, and Kakwani coefficients for expenditures and taxes		
Kg_N	0.363	
$g_N/(1-t+g)$	0.096	
Kt_N	-0.069	
$t_N/(1-t+g)$	0.096	
RSp	**-0.028**	

The ex ante income distribution aggregates households from the nth quintil in Argentina (mixing different quintiles from different provinces). The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household resides.

In all the provinces the inequality in income distribution decreases due to the national budget –from the Gini, and the Atkinson coefficients for very different value judgments. This effect on income distribution may be the result of an individual factor or a combination of factors. For example, according to the RSp, within the list of provinces with highest impact, Corrientes and La Rioja characterize by a high level of progressive expenditure, while Chubut characterizes by a combination of intermediate level and progressive expenditure and high level of progressive taxes. On the other hand, both the city and province of Buenos Aires characterize by a less progressive expenditure combined with a low level of regressive taxes. In Catamarca and San Luis, although national expenditure is progressive the government collects and spends little.

As Figure 2 indicates, some provinces are net financers in the public budget process. In such jurisdictions, there is a trade-off between the positive impact of fiscal budget on inequality and the negative "level effect" in average income. Figure 5 assesses the net effect of fiscal budget using the Atkinson index of welfare for several assumptions on inequality-aversion for selected jurisdictions (we add the index for Argentina), and Table A.7 presents the results for all jurisdictions.

Those net-financing provinces with high negative residual display a welfare index that decreases with fiscal policy for only high values of α (Chubut, Neuquén, Santa Fe y Tierra el Fuego). However, the loss in income is quickly overcome as inequality aversion becomes important.

Figure 5: Welfare assessment for selected jurisdictions.

Jurisdiction	Atkinson ($\alpha = 0.5$)		Atkinson ($\alpha = -1$)		Atkinson ($\alpha = -10$)	
	ex ante	ex post	ex ante	ex post	ex ante	ex post
Buenos Aires	8,776	8,851	4,970	5,471	2,221	2,639
Córdoba	9,490	9,753	5,526	6,286	2,579	3,188
Chubut	16,973	15,745	10,189	10,920	4,746	5,499
Mendoza	10,187	10,385	5,919	6,622	2,734	3,307
Neuquén	19,368	18,958	10,417	11,504	4,610	5,486
Santa Cruz	29,990	30,210	18,373	20,551	8,577	10,331
Santa Fe	9,940	9,821	5,847	6,483	2,635	3,192
Tierra del Fuego	23,015	22,035	13,918	14,894	6,542	7,570
Argentina	**9,823**	**10,091**	**5,618**	**6,451**	**2,569**	**3,256**

Source: own elaboration.

4.4. Is there an "incompatibility problem"? Comparison between the distributive impact of national and provincial budgets.

In section 2 we discussed, as an argument for the centralization of the redistributive policy in the head of national government, the potential incompatibility between national and provincial expenditures. In this section we compare the results of this paper with those obtained in a previous work for provincial budgets (Cont, Peluffo and Porto, 2009). In Figure 6 we present a summary of the impacts of national and provincial fiscal budgets on inequality, together with the progressivity indexes for expenditures and taxes.

Figure 6. National and provincial budgets: inequality, progressivity and income redistribution. Argentina 2004.

Inequality indexes, Gini and Atkinson				
	National budget		Provincial budget	
	ex ante	ex post	ex ante	ex post
Gini	0.4 96	0.469	0.496	0.446
Atkinson ($\alpha = 0{,}5$)	0.211	0.186	0.211	0.147
Atkinson ($\alpha = -1$)	0.600	0.533	0.600	0.425
Atkinson ($\alpha = -10$)	0.821	0.771	0.821	0.672

Reynolds-Smolensky coefficient, and Kakwani coefficients for expenditures and taxes			
National Budget		**Provincial budget**	
Kg_N	0.3 63	Kg_P	0.486
$g_N/(1-t+g)$	0.096	$g_P/(1-t+g)$	0.123
Kt_N	-0.069	$Kt_{N,P}$	-0.079
$t_N/(1-t+g)$	0.096	$t_{N,P}/(1-t+g)$	0.069
		Kt_P	-0.076
		$t_P/(1-t+g)$	0.054
RSp	**-0.028**	**RSp**	**-0.050**

The ex ante income distribution aggregates households from the nth quintil in Argentina (mixing different quintiles from different provinces). The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household resides.

Figure 7 summarizes the relative weights of the effect of national and provincial budgets on the Gini index, opened by expenditures and taxes, at the country level (the details for each province are presented in Table A.8 in the Appendix).

Figure 7. Distribution of the effects of national and provincial budgets on the Gini coefficient for Argentina. Year 2004.

Impact on Gini of	National Budget	Provincial Budget	Consolidated (N+P) Budget
Public Expenditure	-0,035	-0,060	-0,095
	(37%)	(63%)	(100%)
Public Revenues	0,007	0,010	0,017
	(41%)	(59%)	(100%)
Budget	-0,028	-0,050	-0,078
	(36%)	(64%)	(100%)

Source: own elaboration based on Figure 6.

At the aggregate level, the net effect of both national and provincial fiscal policies is an improvement in the personal distribution of income. Public expenditure is progressive at both levels of government, decreasing the Gini in 0.095, with the provincial policy contributing 63% of the effect. On the other hand, taxes are regressive at both levels of governments, increasing the Gini in 0.017, with the provincial policy contributing 59% of the effect. Complementarily, the net weight of national budget on the change in income distribution is 36%. The results are qualitatively the same at the provincial level, with the addition of progressive national taxation on five provinces (remarkably the net-financing jurisdictions with highest net contribution, see Figure 2).

Therefore, at least at this level of analysis public budgets at both levels of government imply no incompatibility.

5. Conclusions and final comments.

This paper studies the impact of national public budget on income distribution. Two relevant dimensions of income distribution, personal and regional, are captured in the analysis at the provincial level.

We observe that, at the aggregate level of provinces, the national budget has positive impact on the personal distribution of income. The Gini coefficient decreases from 0.496 to 0.469. This positive impact results from a combination of progressive expenditures and regressive taxes.

However, the impacts are different among jurisdictions: eight (sixteen) provinces are losers (winners) in the regional redistribution. A trade-off is created between regional and personal dimensions of income distribution: the national fiscal policy improves the personal dimension of income distribution in all provinces,

and also the level of welfare in the eight net-financing provinces under social preferences tilted to redistribution (i.e., an Atkinson index with moderate to high inequality aversion coefficient).

After comparing the effects of national and provincial public budgets, we conclude that there is no incompatibility between the redistributive policies at both levels of government, with the most important impact coming from provincial budgets.

Some final comments are in order. First, the estimations of incidence weights of taxes and expenditures (the γ_{ik} and $\tau_{ir,n}$ weights) imply very strong assumptions –many of them taken from other papers– and therefore the effects of fiscal budget on regional and personal distribution of income should be taken carefully. Nevertheless, we believe that the magnitude of the estimated effects is a good approximation of the real effects. Second, it is very probable that the effects change every year because of different composition and distribution of some kind of expenditures (e.g., capital expenditures) or taxes (e.g., export taxes on oil, gas, agricultural products and their manufactures). Third, we assumed the same equilibrium before and after fiscal policy. However, there are tax costs through excess burden and efficiency costs in the public provision of goods and services (e.g., spillovers or leakages), which we do not address here and leave open for future research.

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Appendix.

The dataset consist of gross geographical product (taken from ECLAC), and national public budget for the year 2004 from the Secretariat of Treasury at the Ministry of Economics. The ex ante distribution of income is taken from CEDLAS-UNLP.

Data on national resources is taken from Ministry of Economics (2005b). In order to determine the impact of taxes on different groups of households (classified into five income categories, according to provincial per capita household income), we use the following assumptions:

Taxes included in the revenue sharing system are distributed among the provinces in order to reflect the source (incidence) of revenues. We use the assumptions made in FIEL (1999), p. 530. Then we assign taxes by quintiles using the criteria proposed by FIEL (1999), p. 361.

Taxes on export are distributed following Gómez Sabaini and Rossignolo (2008) in the case of agricultural based manufactures. Taxes on export of petroleum products are assigned to the highest quintil.

The other items are distributed on a per capita basis, for example, non-tax revenues, sales of state owned goods and services, leasing rents. Capital resources are distributed according to income.

Data on national public expenditure is taken from Ministry of Economics (2005a). The basic information for the distribution of the national expenditures to the provinces was taken from the Ministry of Economics (1999, 2000, 2002).

For each category of national expenditure we allocate expenditure based on different

sources of information and assumptions:

- General administration: per total expenditure.

- Justice: 50% per income and 50% per population.

- Defense and Safety: 50% per income and 50% per population.

- Education: basic education based on the number of pre-school, primary and high school students attending public institutions.

- Culture, Science and Technology: per population.

- Health: based on the number of individuals who are not beneficiaries of a private health insurance program.

- Health Insurance programs – Attention and services: CEDLAS (2004), Table 6.25.

- INSSJyP – Attention and services: PAMI program

- Water and sewerage: 75% by users of the service and 25% by population.

- Housing: according to beneficiaries of loans for housing construction.

- Welfare: according to the number of beneficiaries of different welfare programs (nutrition, clothing, etc.).

- Work and unemployment: 50% per number of individuals unemployed and 50% per beneficiaries of *Jefas and Jefes* program.

- Other urban services: based on the use of urban services (paved roads, sewerage, public lighting and refuse collection).

- Family allocations: CEDLAS (2004), Table 11.9.

- Primary production: among land owners.

- Energy, fuel and mining: according to consumption of energy and fuels.

- Industry: according to consumption of industrial products.

- Transport and communication services: 1/3 according to total consumption of goods, 1/3 according to expenditure on automobile and 1/3 according to tourism expenditures.

Table A.1: Per capita income (gross geographical product) and income distribution, by province. Values in Argentine pesos. Year 2004.

Jurisdiction	Quintil 1 pc income	Quintil 1 % of income	Quintil 2 pc income	Quintil 2 % of income	Quintil 3 pc income	Quintil 3 % of income	Quintil 4 pc income	Quintil 4 % of income	Quintil 5 pc income	Quintil 5 % of income	Total pc income
1 Ciudad Bs As	5,691	3.6%	12,798	8.0%	21,453	13.5%	34,761	21.9%	84,369	53.0%	31,817
2 Buenos Aires	1,891	3.6%	4,550	8.7%	7,473	14.3%	11,656	22.3%	26,585	51.0%	10,434
3 Catamarca	2,880	3.6%	6,218	7.8%	10,305	13.0%	16,193	20.4%	43,611	55.1%	15,852
4 Córdoba	2,195	3.9%	4,788	8.5%	7,875	14.0%	12,730	22.6%	28,721	51.0%	11,263
5 Corrientes	959	3.7%	2,016	7.7%	3,225	12.3%	5,609	21.4%	14,369	54.9%	5,237
6 Chaco	1,117	4.2%	2,142	8.2%	3,314	12.6%	5,397	20.5%	14,259	54.4%	5,251
7 Chubut	4,040	4.0%	9,235	9.3%	14,296	14.3%	22,300	22.2%	49,659	50.2%	19,966
8 Entre Ríos	1,384	3.7%	3,264	8.7%	5,391	14.4%	8,394	22.4%	19,057	50.8%	7,502
9 Formosa	799	3.6%	1,761	8.0%	2,924	13.4%	4,362	19.9%	12,022	55.0%	4,377
10 Jujuy	1,262	4.4%	2,424	8.5%	3,821	13.3%	6,095	21.3%	15,014	52.5%	5,725
11 La Pampa	2,303	3.5%	5,908	9.0%	9,972	15.2%	15,203	23.2%	31,977	49.0%	13,083
12 La Rioja	1,582	5.0%	2,878	9.1%	4,271	13.5%	6,845	21.5%	16,169	51.0%	6,353
13 Mendoza	2,328	3.9%	5,235	8.7%	8,497	14.1%	13,511	22.3%	30,853	51.1%	12,089
14 Misiones	1,273	4.7%	2,364	8.7%	3,918	14.4%	5,866	21.6%	13,708	50.5%	5,426
15 Neuquén	3,925	3.3%	9,299	7.9%	15,616	13.3%	26,718	22.7%	61,675	52.7%	23,469
16 Río Negro	2,164	4.2%	4,131	8.2%	6,401	12.6%	10,412	20.5%	27,627	54.4%	10,150
17 Salta	1,008	3.2%	2,023	6.5%	3,414	10.9%	6,189	19.8%	18,634	59.6%	6,257
18 San Juan	1,184	4.1%	2,487	8.6%	3,986	13.9%	5,889	20.4%	15,205	53.0%	5,756
19 San Luis	2,987	5.1%	5,475	9.4%	8,853	15.2%	13,467	23.1%	27,486	47.2%	11,656
20 Santa Cruz	7,302	4.2%	16,232	9.3%	27,559	15.9%	39,624	22.8%	82,918	47.8%	34,743
21 Santa Fe	2,243	3.9%	5,376	9.3%	8,740	15.1%	13,642	23.5%	28,066	48.3%	11,616
22 Santiago del Estero	723	3.0%	1,681	7.0%	3,003	12.5%	5,083	21.1%	13,555	56.5%	4,816
23 Tucumán	1,089	3.9%	2,351	8.5%	3,662	13.2%	5,869	21.1%	14,776	53.3%	5,555
24 Tierra del Fuego	5,570	4.1%	12,617	9.3%	19,235	14.3%	29,629	21.9%	67,995	50.4%	27,024
Argentina	1,780	3.0%	4,043	6.6%	6,816	11.3%	12,363	22.7%	32,764	56.4%	11,710

Source: Own estimates based on INDEC, ECLAC and Secretary of Treasury, Ministry of Economics.

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Table A.2: Per capita national public expenditure, by province. Values in Argentine pesos. Year 2004.

Jurisdiction	National revenue (to national budget)	Rkg	National expenditure	Rkg	Residual	Rkg	Ex post income	Rkg
1 Ciudad Bs As	2,327	5	2,841	1	514	2	32,330	2
2 Buenos Aires	1,027	9	910	16	-116	19	10,318	13
3 Catamarca	480	20	1,020	14	540	3	16,392	6
4 Córdoba	1,074	7	1,060	10	-14	17	11,249	10
5 Corrientes	456	21	1,303	7	847	1	6,084	18
6 Chaco	450	22	875	23	426	7	5,677	22
7 Chubut	3,853	1	1,448	4	-2,405	24	17,561	5
8 Entre Ríos	745	13	899	17	154	15	7,656	14
9 Formosa	408	24	893	22	485	4	4,862	24
10 Jujuy	515	19	924	18	408	8	6,133	17
11 La Pampa	807	12	1,212	6	405	5	13,487	7
12 La Rioja	683	15	1,131	9	447	6	6,800	15
13 Mendoza	1,038	8	968	13	-70	18	12,018	8
14 Misiones	563	18	890	20	327	11	5,754	21
15 Neuquén	2,522	4	1,187	5	-1,335	22	22,134	4
16 Río Negro	959	10	1,140	8	182	14	10,331	12
17 Salta	820	11	883	21	63	16	6,320	16
18 San Juan	663	16	980	15	317	13	6,073	19
19 San Luis	720	14	1,041	11	320	9	11,976	9
20 Santa Cruz	3,225	3	2,390	2	-835	21	33,908	1
21 Santa Fe	1,495	6	999	12	-495	20	11,121	11
22 Santiago del Estero	445	23	781	24	335	12	5,151	23
23 Tucumán	569	17	911	19	342	10	5,897	20
24 Tierra del Fuego	3,407	2	1,329	3	-2,078	23	24,946	3
Argentina	1,120		1,120		0		11,710	
Standard deviation	0.92		0.43					
Max/Min	9.4		3.6					

Table A.3: Distribution of income (pre and post national budget), revenue and expenditure, year 2004.

Jurisdiction	Quintil 1				Quintil 2				Quintil 3				Quintil 4				Quintil 5			
	ex ante	tax N	exp N	ex post	ex ante	tax N	exp N	ex post	ex ante	tax N	exp N	ex post	ex ante	tax N	exp N	ex post	ex ante	tax N	exp N	ex post
1 Ciudad Bs As	3.6	8.2	17.5	4.5	8.0	11.8	17.8	8.6	13.5	21.3	19.4	13.4	21.9	28.9	19.3	21.1	53.0	29.8	26.0	52.3
2 Buenos Aires	3.6	8.7	17.9	4.4	8.7	11.5	17.4	9.2	14.3	14.9	17.9	14.6	22.3	18.5	21.4	22.6	51.0	46.5	25.5	49.2
3 Catamarca	3.6	9.9	16.7	4.3	7.8	11.8	18.6	8.4	13.0	15.1	20.0	13.4	20.4	19.0	20.8	20.5	55.1	44.2	24.0	53.5
4 Córdoba	3.9	7.7	17.8	4.8	8.5	10.2	18.0	9.2	14.0	13.0	20.6	14.7	22.6	16.3	24.6	23.4	51.0	52.9	19.0	47.8
5 Corrientes	3.7	11.2	29.7	8.7	7.7	11.3	18.1	9.7	12.3	15.0	16.4	13.0	21.4	19.0	16.4	20.5	54.9	43.4	19.4	48.1
6 Chaco	4.2	10.8	19.7	6.1	8.2	10.9	19.5	9.7	12.6	14.7	18.3	13.3	20.5	18.0	19.1	20.5	54.4	45.5	23.5	50.4
7 Chubut	4.0	3.6	18.7	5.3	9.3	4.7	20.4	11.2	14.3	5.8	16.9	16.4	22.2	9.5	21.0	24.9	50.2	76.4	23.0	42.2
8 Entre Ríos	3.7	9.2	17.9	4.8	8.7	11.4	20.3	9.8	14.4	14.8	18.9	14.9	22.4	18.8	19.8	22.4	50.8	45.7	23.1	48.1
9 Formosa	3.6	10.7	17.8	5.6	8.0	11.6	19.6	9.9	13.4	14.7	19.0	14.3	19.9	19.0	19.3	19.9	55.0	43.9	24.2	50.3
10 Jujuy	4.4	11.1	18.0	5.9	8.5	12.3	20.1	9.9	13.3	15.3	19.3	14.1	21.3	19.5	20.4	21.3	52.5	41.9	22.2	48.8
11 La Pampa	3.5	8.1	20.1	4.7	9.0	11.3	19.7	9.9	15.2	14.5	21.0	15.8	23.2	19.7	20.8	23.2	49.0	46.4	18.4	46.4
12 La Rioja	5.0	7.6	20.0	7.2	9.1	10.0	19.8	10.7	13.5	12.1	20.0	14.7	21.5	15.1	19.7	21.9	51.0	55.2	20.6	45.5
13 Mendoza	3.9	6.9	17.8	4.7	8.7	9.1	17.0	9.3	14.1	11.6	18.6	14.6	22.3	14.4	21.1	22.9	51.1	58.0	25.5	48.4
14 Misiones	4.7	9.2	20.8	6.7	8.7	10.7	17.8	9.9	14.4	13.8	18.2	15.1	21.6	17.6	18.6	21.5	50.5	48.7	24.7	46.7
15 Neuquén	3.3	3.6	20.5	4.2	7.9	4.4	18.3	8.9	13.3	5.6	18.5	14.5	22.7	8.8	19.6	24.1	52.7	77.6	23.1	48.3
16 Río Negro	4.2	7.3	20.1	5.7	8.2	10.3	18.9	9.1	12.6	13.1	17.8	13.2	20.5	24.1	19.5	20.1	54.4	45.2	23.7	51.9
17 Salta	3.2	6.9	16.5	4.6	6.5	7.6	18.6	8.0	10.9	9.8	19.2	12.2	19.8	13.5	20.0	20.6	59.6	62.1	25.7	54.5
18 San Juan	4.1	9.6	18.2	5.8	8.6	12.2	16.6	9.5	13.9	15.2	19.6	14.6	20.4	18.4	21.2	20.8	53.0	44.6	24.5	49.3
19 San Luis	5.1	9.0	19.2	6.1	9.4	11.8	17.2	9.9	15.2	14.7	19.3	15.6	23.1	18.2	21.1	23.3	47.2	46.3	23.2	45.1
20 Santa Cruz	4.2	3.9	17.8	5.2	9.3	5.1	19.4	10.5	15.9	7.1	18.5	16.9	22.8	10.8	21.8	23.9	47.8	73.2	22.5	43.6
21 Santa Fe	3.9	6.1	18.9	4.9	9.3	8.0	18.0	10.2	15.1	10.6	17.5	15.9	23.5	12.9	20.6	24.6	48.3	62.4	25.0	44.4
22 Santiago del Estero	3.0	11.1	21.5	5.1	7.0	11.7	18.5	8.3	12.5	15.2	19.3	13.3	21.1	20.0	18.2	20.7	56.5	41.9	22.5	52.6
23 Tucumán	3.9	9.8	17.7	5.5	8.5	11.9	18.4	9.7	13.2	14.5	18.2	13.8	21.1	18.9	20.6	21.3	53.3	44.9	25.0	49.8
24 Tierra del Fuego	4.1	3.8	23.5	5.2	9.3	5.2	19.6	10.5	14.3	6.0	17.4	15.6	21.9	11.6	19.6	23.2	50.4	73.5	19.8	45.6
Argentina	3.0	6.5	15.7	3.9	6.6	8.3	14.7	7.3	11.3	11.8	17.8	11.9	22.7	18.6	22.3	23.0	56.4	54.7	29.5	53.9

Source: own elaboration.

Table A.4: Per capita income (pre and post national budget). Values in Argentine pesos. Year 2004.

Jurisdiction	Quintil 1		Quintil 2		Quintil 3		Quintil 4		Quintil 5		Total			
	ex ante	ex post	ex ante	ex post	ex ante	ex post	ex ante	ex post	ex ante	ex post	ex ante		ex post	
1 Ciudad Bs As	5,691	7,222	12,798	13,956	21,453	21,729	34,761	34,133	84,369	84,600	31,817	2	32,330	2
2 Buenos Aires	1,891	2,261	4,550	4,751	7,473	7,520	11,656	11,681	26,585	25,361	10,434	12	10,318	13
3 Catamarca	2,880	3,494	6,218	6,882	10,305	10,963	16,193	16,796	43,611	43,774	15,852	6	16,392	6
4 Córdoba	2,195	2,727	4,788	5,196	7,875	8,269	12,730	13,160	28,721	26,888	11,263	11	11,249	10
5 Corrientes	959	2,637	2,016	2,942	3,225	3,953	5,609	6,241	14,369	14,642	5,237	22	6,084	18
6 Chaco	1,117	1,738	2,142	2,750	3,314	3,782	5,397	5,827	14,259	14,262	5,251	21	5,677	22
7 Chubut	4,040	4,697	9,235	9,799	14,296	14,402	22,300	21,996	49,659	36,735	19,966	5	17,561	5
8 Entre Ríos	1,384	1,848	3,264	3,749	5,391	5,689	8,394	8,583	19,057	18,393	7,502	14	7,656	14
9 Formosa	799	1,375	1,761	2,400	2,924	3,473	4,362	4,837	12,022	12,208	4,377	24	4,862	24
10 Jujuy	1,262	1,808	2,424	3,037	3,821	4,317	6,095	6,536	15,014	14,960	5,725	18	6,133	17
11 La Pampa	2,303	3,200	5,908	6,645	9,972	10,658	15,203	15,667	31,977	31,220	13,083	7	13,487	7
12 La Rioja	1,582	2,453	2,878	3,654	4,271	4,991	6,845	7,439	16,169	15,446	6,353	15	6,800	15
13 Mendoza	2,328	2,831	5,235	5,586	8,497	8,794	13,511	13,786	30,853	29,077	12,089	8	12,018	8
14 Misiones	1,273	1,942	2,364	2,852	3,918	4,339	5,866	6,197	13,708	13,436	5,426	20	5,754	21
15 Neuquén	3,925	4,692	9,299	9,824	15,616	16,011	26,718	26,771	61,675	53,285	23,469	4	22,134	4
16 Río Negro	2,164	2,960	4,131	4,714	6,401	6,790	10,412	10,368	27,627	26,813	10,150	13	10,331	12
17 Salta	1,008	1,452	2,023	2,531	3,414	3,859	6,189	6,521	18,634	17,222	6,257	16	6,320	16
18 San Juan	1,184	1,757	2,487	2,894	3,986	4,442	5,889	6,316	15,205	14,930	5,756	17	6,073	19
19 San Luis	2,987	3,662	5,475	5,947	8,853	9,325	13,467	13,909	27,486	27,028	11,656	9	11,976	9
20 Santa Cruz	7,302	8,807	16,232	17,725	27,559	28,638	39,624	40,493	82,918	73,803	34,743	1	33,908	1
21 Santa Fe	2,243	2,735	5,376	5,673	8,740	8,822	13,642	13,706	28,066	24,657	11,616	10	11,121	11
22 Santiago del Estero	723	1,314	1,681	2,141	3,003	3,417	5,083	5,349	13,555	13,502	4,816	23	5,151	23
23 Tucumán	1,089	1,616	2,351	2,853	3,662	4,080	5,869	6,271	14,776	14,638	5,555	19	5,897	20
24 Tierra del Fuego	5,570	6,484	12,617	13,035	19,235	19,377	29,629	28,963	67,995	56,805	27,024	3	24,946	3
Argentina	1,780	2,300	4,043	4,415	6,816	7,165	12,363	12,554	32,764	31,360	11,710		11,710	

Source: own elaboration.

Table A.5: Gini and Atkinson coefficients of inequality. Year 2004.

Jurisdiction	Gini				Atkinson (α = 0,5)				Atkinson (α = -1)				Atkinson (α = -10)			
	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg
1 City Bs As (CABA)	0.451	9	0.433	3	0.171	7	0.156	3	0.539	6	0.480	3	0.790	5	0.738	4
2 Buenos Aires	0.434	13	0.412	7	0.159	12	0.142	6	0.524	8	0.468	5	0.787	6	0.743	3
3 Catamarca	0.462	4	0.442	2	0.180	4	0.163	2	0.543	5	0.496	1	0.787	7	0.750	2
4 Córdoba	0.433	14	0.400	10	0.157	15	0.133	9	0.509	13	0.440	8	0.771	13	0.715	9
5 Corrientes	0.465	3	0.359	22	0.181	3	0.107	22	0.545	4	0.315	24	0.785	9	0.506	24
6 Chaco	0.451	7	0.397	12	0.170	8	0.130	13	0.504	14	0.390	18	0.750	19	0.641	20
7 Chubut	0.421	17	0.350	24	0.150	18	0.103	23	0.490	18	0.377	20	0.762	15	0.686	14
8 Entre Ríos	0.432	16	0.397	13	0.158	14	0.131	12	0.519	10	0.434	9	0.783	10	0.716	8
9 Formosa	0.459	5	0.397	11	0.178	5	0.131	11	0.538	7	0.402	14	0.786	8	0.668	16
10 Jujuy	0.436	12	0.389	15	0.158	13	0.124	16	0.485	19	0.389	19	0.741	21	0.654	19
11 La Pampa	0.421	18	0.387	16	0.151	17	0.125	15	0.523	9	0.432	10	0.793	4	0.721	7
12 La Rioja	0.418	21	0.351	23	0.144	22	0.100	24	0.446	23	0.320	23	0.708	23	0.577	23
13 Mendoza	0.433	15	0.404	8	0.157	16	0.135	8	0.510	12	0.447	7	0.774	11	0.723	6
14 Misiones	0.418	20	0.366	19	0.145	20	0.109	19	0.460	22	0.348	22	0.725	22	0.604	22
15 Neuquén	0.454	6	0.413	6	0.175	6	0.143	5	0.556	3	0.479	4	0.804	3	0.751	1
16 Río Negro	0.451	8	0.413	5	0.170	9	0.141	7	0.504	15	0.418	11	0.750	20	0.664	17
17 Salta	0.505	1	0.450	1	0.215	1	0.168	1	0.599	1	0.491	2	0.811	2	0.730	5
18 San Juan	0.438	11	0.393	14	0.161	11	0.127	14	0.499	16	0.397	16	0.758	16	0.660	18
19 San Luis	0.391	24	0.366	20	0.126	24	0.109	20	0.421	24	0.365	21	0.699	24	0.641	21
20 Santa Cruz	0.403	23	0.361	21	0.137	23	0.109	21	0.471	21	0.393	17	0.753	18	0.695	13
21 Santa Fe	0.413	22	0.373	18	0.144	21	0.116	17	0.497	17	0.415	12	0.773	12	0.711	10
22 Santiago del Estero	0.484	2	0.430	4	0.200	2	0.153	4	0.598	2	0.455	6	0.824	1	0.700	11
23 Tucumán	0.446	10	0.401	9	0.167	10	0.132	10	0.515	11	0.412	13	0.770	14	0.678	15
24 Tierra del Fuego	0.421	19	0.374	17	0.148	19	0.116	18	0.485	20	0.401	15	0.758	17	0.695	12

Source: own elaboration.

Table A.6: Reynolds-Smolensky (RSp), Kakwani for expenditure (Kg) and revenues (Kt). Year 2004.

Jurisdiction	Kg_N	Rkg	$g_N/(1-t+g)$	Rkg	Kt_N	Rkg	$t_N/(1-t+g)$	Rkg	RSp	Rkg
1 City Bs As (CABA)	0.377	18	0.088	17	-0.209	24	0.072	21	-0.018	24
2 Buenos Aires	0.357	20	0.088	16	-0.103	14	0.100	8	-0.021	22
3 Catamarca	0.395	13	0.062	22	-0.159	19	0.029	24	-0.020	23
4 Córdoba	0.397	12	0.094	13	-0.047	9	0.095	12	-0.033	19
5 Corrientes	0.555	1	0.214	1	-0.177	22	0.075	20	-0.106	1
6 Chaco	0.423	7	0.154	7	-0.145	18	0.079	19	-0.054	7
7 Chubut	0.386	15	0.082	19	0.182	1	0.219	1	-0.072	2
8 Entre Ríos	0.393	14	0.117	11	-0.111	15	0.097	10	-0.035	17
9 Formosa	0.409	10	0.184	2	-0.164	21	0.084	18	-0.061	4
10 Jujuy	0.401	11	0.151	9	-0.161	20	0.084	17	-0.047	9
La Pampa	0.431	4	0.090	15	-0.080	12	0.060	23	-0.034	18
12 La Rioja	0.414	9	0.166	3	-0.016	7	0.101	7	-0.067	3
13 Mendoza	0.355	22	0.081	20	-0.003	6	0.086	16	-0.028	20
14 Misiones	0.384	16	0.155	5	-0.075	11	0.098	9	-0.052	8
15 Neuquén	0.428	5	0.054	23	0.156	4	0.114	5	-0.041	14
16 Río Negro	0.420	8	0.110	12	-0.093	13	0.093	14	-0.038	16
17 Salta	0.426	6	0.140	10	-0.040	8	0.130	4	-0.054	6
18 San Juan	0.369	19	0.161	4	-0.134	16	0.109	6	-0.045	12
19 San Luis	0.344	24	0.087	18	-0.067	10	0.060	22	-0.026	21
20 Santa Cruz	0.356	21	0.070	21	0.175	2	0.095	13	-0.042	13
21 Santa Fe	0.353	23	0.090	14	0.057	5	0.134	3	-0.039	15
22 Santiago del Estero	0.478	2	0.152	8	-0.206	23	0.086	15	-0.055	5
23 Tucumán	0.379	17	0.155	6	-0.137	17	0.097	11	-0.045	11
24 Tierra del Fuego	0.451	3	0.053	24	0.162	3	0.137	2	-0.046	10

Source: own elaboration.

Table A.7: Welfare assessment for Argentine jurisdictions. Year 2004.

Jurisdiction	Atkinson (α = 0.5)		Atkinson (α = -1)		Atkinson (α = -10)	
	ex ante	ex post	ex ante	ex post	ex ante	ex post
1 City Bs As (CABA)	26,370	27,300	14,659	16,821	6,685	8,482
2 Buenos Aires	8,776	8,856	4,970	5,490	2,221	2,655
3 Catamarca	13,001	13,717	7,249	8,263	3,383	4,104
4 Córdoba	9,490	9,759	5,526	6,303	2,579	3,203
5 Corrientes	4,288	5,431	2,384	4,164	1,126	3,005
6 Chaco	4,360	4,939	2,605	3,460	1,311	2,040
7 Chubut	16,973	15,751	10,189	10,940	4,746	5,517
8 Entre Ríos	6,318	6,656	3,608	4,331	1,626	2,171
9 Formosa	3,600	4,226	2,021	2,906	938	1,615
10 Jujuy	4,821	5,373	2,946	3,748	1,482	2,122
11 La Pampa	11,102	11,802	6,244	7,661	2,706	3,758
12 La Rioja	5,437	6,120	3,517	4,626	1,858	2,875
13 Mendoza	10,187	10,390	5,919	6,641	2,734	3,325
14 Misiones	4,639	5,126	2,929	3,754	1,495	2,276
15 Neuquén	19,368	18,967	10,417	11,535	4,610	5,512
16 Río Negro	8,429	8,875	5,037	6,016	2,541	3,473
17 Salta	4,909	5,257	2,507	3,217	1,184	1,705
18 San Juan	4,829	5,301	2,885	3,663	1,390	2,063
19 San Luis	10,184	10,672	6,748	7,606	3,508	4,298
20 Santa Cruz	29,990	30,214	18,373	20,566	8,577	10,344
21 Santa Fe	9,940	9,826	5,847	6,503	2,635	3,212
22 Santiago del Estero	3,854	4,364	1,937	2,807	850	1,543
23 Tucumán	4,629	5,117	2,696	3,467	1,279	1,898
24 Tierra del Fuego	23,015	22,048	13,918	14,940	6,542	7,616

Source: own elaboration.

Table A.8: Decomposition matrix for Gini coefficient: National and Provincial Budgets. Year 2006.

Change in Gini due to	National Expenditure	% N+P Exp	Provincial Expenditure	% N+P Exp	National Revenues	% N+P Rev	Provincial Revenues	% N+P Rev	National Budget	% N+P Budget	Provincial Buget	% N+P Budget
1 City Bs As (CABA)	-0.033	49%	-0.034	51%	0.015	41%	0.022	59%	-0.018	59%	-0.012	41%
2 Buenos Aires	-0.032	40%	-0.046	60%	0.010	57%	0.008	43%	-0.021	35%	-0.039	65%
3 Catamarca	-0.025	24%	-0.078	76%	0.005	39%	0.007	61%	-0.020	22%	-0.071	78%
4 Córdoba	-0.037	43%	-0.050	57%	0.004	39%	0.007	61%	-0.033	44%	-0.043	56%
5 Corrientes	-0.119	55%	-0.097	45%	0.013	59%	0.009	41%	-0.106	55%	-0.087	45%
6 Chaco	-0.065	34%	-0.127	66%	0.011	51%	0.011	49%	-0.054	32%	-0.116	68%
7 Chubut	-0.032	31%	-0.070	69%	-0.040		0.036		-0.072	68%	-0.034	32%
8 Entre Ríos	-0.046	35%	-0.087	65%	0.011	56%	0.008	44%	-0.035	31%	-0.078	69%
9 Formosa	-0.075	35%	-0.138	65%	0.014	52%	0.013	48%	-0.061	33%	-0.125	67%
10 Jujuy	-0.060	35%	-0.113	65%	0.014	61%	0.009	39%	-0.047	31%	-0.105	69%
11 La Pampa	-0.039	30%	-0.089	70%	0.005	36%	0.009	64%	-0.034	30%	-0.080	70%
12 La Rioja	-0.069	30%	-0.162	70%	0.002	27%	0.004	73%	-0.067	30%	-0.158	70%
13 Mendoza	-0.029	32%	-0.061	68%	0.000	2%	0.013	98%	-0.028	37%	-0.047	63%
14 Misiones	-0.059	45%	-0.073	55%	0.007	46%	0.009	54%	-0.052	45%	-0.064	55%
15 Neuquén	-0.023	21%	-0.088	79%	-0.018		0.052		-0.041	53%	-0.036	47%
16 Río Negro	-0.046	32%	-0.098	68%	0.009	25%	0.026	75%	-0.038	35%	-0.072	65%
17 Salta	-0.059	39%	-0.094	61%	0.005	26%	0.015	74%	-0.054	41%	-0.079	59%
18 San Juan	-0.060	33%	-0.122	67%	0.015	60%	0.010	40%	-0.045	29%	-0.112	71%
19 San Luis	-0.030	26%	-0.085	74%	0.004	43%	0.005	57%	-0.026	24%	-0.080	76%
20 Santa Cruz	-0.025	28%	-0.066	72%	-0.017		0.034		-0.042	57%	-0.032	43%
21 Santa Fe	-0.032	38%	-0.053	62%	-0.008		0.006		-0.039	46%	-0.047	54%
22 Santiago del Estero	-0.072	34%	-0.143	66%	0.018	66%	0.009	34%	-0.055	29%	-0.134	71%
23 Tucumán	-0.059	33%	-0.120	67%	0.013	52%	0.012	48%	-0.045	30%	-0.108	70%
24 Tierra del Fuego	-0.024	19%	-0.100	81%	-0.022		0.027		-0.046	39%	-0.073	61%

<u>Source:</u> own elaboration and Cont, Peluffo and Porto (2009).

Personal and Regional Redistribution through the National and Provincial Budgets in Argentina. 2004.

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Resumen.

Este trabajo se estudia el impacto del presupuesto consolidado nación-provincias sobre la distribución personal y regional del ingreso en la Argentina en el año 2004, a nivel agregado (nacional) y desagregado (provincias). La agregación de resultados oculta las diferencias interprovinciales porque hay provincias ganadoras y perdedoras en la distribución territorial de los gastos e impuestos nacionales y del esquema de coparticipación de impuestos y también porque los diferentes niveles de gobierno utilizan distintos instrumentos para redistribuir ingresos.

Los principales resultados son que el presupuesto público consolidado tiene un efecto agregado positivo sobre la distribución personal del ingreso, que resulta de la combinación de gastos progresivos e impuestos levemente regresivos. Estos impactos son diferentes a nivel de provincias y del nivel de gobierno que ejecuta el presupuesto. El presupuesto nacional redistribuye ingreso entre provincias (por ejemplo, en ocho provincias la diferencia entre gastos e impuestos es negativa –son perdedoras en la redistribución). No obstante, en todas las provincias la distribución personal mejora. A nivel provincial el impacto distributivo es positivo (principalmente a través de la progresividad del gasto provincial), interactuando con las transferencias nacionales, de modo tal de reforzar la progresividad en las provincias receptoras netas y creando un "trade-off" entre progresividad y transferencia nacional negativa en las financiadoras netas. No hay incompatibilidad entre los efectos redistributivos de los presupuestos nacional y provinciales.

JEL Code: H7, I3.

Abstract.

This paper studies the impact of national and provincial budgets on the personal and regional distribution of income in Argentina using budget information for the year 2004, both at the aggregate (national) and disaggregate (provincial) levels. The aggregation of results hides inter-provincial effects because some province may be winner or loser in the regional distribution through the national budget and the revenue sharing regime and also because national and provincial governments use different instruments to redistribute income.

The main results of the paper are summarized as follows. The aggregate effect of the consolidated public budget is a positive impact on the personal income distribution, which results from a combination of progressive expenditures and slightly regressive taxes. The impact is different depending on the province and level of government that exerts the budget. The national budget redistributes income across regions (in eight provinces the difference between expenditures and taxes is negative –they are losers in the redistribution). In spite of that, the national budget improves the personal distribution of income in all provinces. Sub-national budgets have a positive distributive impact, mostly from progressive expenditures (the most important instrument for redistribution), but also from interacting with the revenue-sharing regime, which reinforces progressivity in net-receiving provinces but creates a trade-off between progressivity and (negative) regional transfer in net-financing ones. There is no incompatibility between the redistributive effects of national and provincial budgets.

1. Introduction.

In a federal system, income distribution is affected by taxes, expenditures and intergovernmental transfers of national and sub-national governments.

Most research in this field focuses on the impact of public budget on either personal or regional distribution of income. Very few papers integrate both effects. This paper studies the impact of the national and provincial government budgets on the distribution of income using budget information for the year 2004, considering the allocation of expenditures, taxes and the national revenue sharing regime at regional (provinces) and personal (quintiles) levels.

The main results of the paper are summarized as follows. At the aggregate level, the national budget has positive impact on the personal income distribution. The positive impact results from a combination of progressive expenditures and regressive taxes. Theses impacts are different at the level of each province. In eight

provinces the difference between expenditures and taxes is negative so that they are losers or net financers in the geographic redistribution. The net effect of national budget on personal distribution, however, is positive for all the provinces. At the level of provincial budgets, the positive distributive impact of subnational expenditures and taxes interact with the revenue-sharing regime, reinforcing progressivity in net-receiving provinces but creating a trade-off between progressivity and (negative) regional transfer in net-financing ones (mainly the city of Buenos Aires and the province of Buenos Aires). In the latter jurisdictions, however, the net effect of provincial budgets on personal distribution is positive. The Atkinson index of welfare that weighs personal and regional redistribution (through national budget and revenue sharing) is positive, except for very Benthamian welfare functions in two of the net financing jurisdictions. Finally, we do not find incompatibility between the redistributive effects of national and provincial budgets.

The paper is organized as follows. In Section 2, we put the paper in context. In Section 3, we provide the basic definitions and the methodological framework. Section 4 presents the main results. Finally, Section 5 concludes.

2. Context.

Income distribution has been, from both a theoretical and historical perspective, one of the most intense research areas in economics. Research has been divided in positive approach, i.e., the study of the laws of income distribution in a capitalist economy,[49] and normative approach, i.e., the study of the instruments to modify such distribution following some value judgment.

In the normative approach, the relevance of income distribution evolved along two variants (Musgrave, 1996).[50] In the "service state", which establishes that the main role of the state is to allow the proper functioning of the market economy by providing a legal system, protection to society from foreign aggressions, public works that –because of size– cannot be provided by the private sector and the basic education to the poor, the tax principles according to benefits and ability to pay we-

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49. Rigorous analysis of the first approach dates from the beginning of the XIX Century, with Ricardo (1817) for whom "the principal problem of political economy was the determination of the laws governing the distribution of national income among the classes of society" (p. 5). The Ricardian theory gave birth to two principles of income distribution: the "marginal principle" and the "surplus principle". The first principle is adopted by the Neoclassic School (see Hicks, 1932), and the second is adopted by the Marxist School (see Dobb, 1972).

50. There is a third approach, that goes back to positive theory and considers a "flawed state", which pursues the objective of bureaucrats and/or politicians that capture the fiscal apparatus fulfilling own goals rather than general interest (Brennan and Buchanan, 1977, 1978).

re assumed to coincide, so that the distributional impact of fiscal policy would be neutral. Instead, in the "welfare state", one of the functions of the government is to correct the income distribution which results from market forces.

A first question regarded the level of government that should be responsible for the income distribution task in a federal (multilevel) public sector: national, provincial or local, or all of them, in which case a second question would be how to share this responsibility. The early answer to both questions was clear. Musgrave (1959) and Oates (1972) concluded that the central theme of fiscal federalism is found in the proposition that the provision of services should be assigned among the different levels of government, but the stabilization and distribution branches should be concentrated at the national level. According to this point of view allowing redistribution at sub-national level has two problems (Tresch, 2002). One arises from the mobility of people. Rich people have an incentive to move to other jurisdictions with lower taxes and poor people have an incentive to move to jurisdictions with higher benefits. These migrations tend to frustrate the redistribution at the cost of a lower per capita income (this is the "competition problem"). The other problem is the incompatibilities that can arise, even without mobility, when more than one level of government redistributes income (the "incompatibility problem"). "Suppose local government L wants to effect a redistribution from citizens in group A to citizens in group B, but the national government prefers a net redistribution from group B to group A. One can imagine and endless chain of redistributions as each government tries to have its way. Of course, this sort of game must be ruled out, and the most obvious way is to deny one government the right to redistribute" (Tresch, 2002, p. 842).

A third question regarded the relevant dimension of distribution: Should the aim of the public policy be the regional distribution of income, the personal distribution or both? The answer in this case was that personal distribution of income should be the matter of concern, because the arguments included in the welfare function are individuals' utilities. Moreover, there was recognition of a possible failure in the regional distribution principle. In particular, it could be the case that regional redistribution could generate a result in which rich people from poor regions be subsidized by poor people from rich regions.

Empirical research followed these guidelines. The leading focus of such research was the impact of national or consolidated public budget on personal income distribution, while the regional dimension was relegated to play a supporting role. As a consequence, the analysis of the relationship between personal and regional dimensions of income distribution was even less explored.

The early propositions of allocating income distribution policy to the national government and focusing attention on personal distribution of income were both

subject to challenges. First, the literature that followed recognized the existence of constraints for decentralized redistributive policies, because of mobility of goods and factors across regions (Oates, 1972, King, 1984, Brown and Oates, 1987). But, on the theoretical side, Pauly (1973) justified the sub-national government interventions under the assumption of altruistic rich households (i.e., their utility depends on both own and poor's disposable income). Wildasin (1992) analyzed the effect of the growing factor mobility as a restraining factor to local redistributive policy, not only among regions within a country but also among countries. As a result, rich households would accept to transfer part of their income to low-income neighbors. Bird (1995) raised another point concerning the functions of the different levels of government by stating that "A government, whether local or central, that is not concerned with distribution is less a government than simply one of the many alternative organizational structures that may be used to deliver certain services". Recently, Tresch (2002) set up a hierarchically nested structure of welfare functions to argue that "It is no longer true that redistributions among people at the national level are the 'preferred alternative', as Oates claimed. In the alternative model presented here, only the lowest level government redistributes among the people. The higher governments use grant-in-aid to other governments exclusively in their redistributions." (p. 851).

On the empirical side, the evidence points to the existence of a significant impact of sub-national governments' budget on regional distribution of income, especially due to revenue-sharing regimens. Moreover, country Constitutions and legal documents include dispositions that define regional distribution of income as an objective to fulfill.[51] When both levels of government share the redistributive function the "incompatibility problem" must be empirically studied.

First efforts to measure the impact of fiscal policy on income distribution concentrated mainly on tax incidence (among others, Musgrave and Thin, 1948, and Musgrave, 1964). However, Musgrave (1964) acknowledged that "… any meaningful theory or policy of public finance must ultimately combine the issues posed by the two sides of the budget. This, indeed, is the cardinal principle of the eco-

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51. Some examples of Constitutions and legal documents that define the regional distribution of income are Canada ("Parliament and the Government of Canada are committed to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation", Constitutional Act, 1982) and Argentina ("The distribution between the Nation, the Provinces and the city of Buenos Aires, and among them […], will be fair, solidary and will give priority to the achievement of an equivalent level of development, life standard and equal opportunities throughout the national territory" National Constitution of 1994, Art. 75° inc. 2). The regional cohesion policy, included in the Project of the European Constitution in 1994, is another case.

nomist's view of public finance. The distributional implications of expenditure policy, therefore, pose an important further problem."

Argentina has been a fruitful research field in the area of income distribution and the impact of public policy. Herschel (1963) is the first study that estimates regional and personal distribution of income and the impact of fiscal policy. Dieguez and Petrecolla (1979) study in detail the determinants of income distribution in the Great Buenos Aires. Petrei (1989) analyzes the case of public expenditure in education, health, social security, housing and water and sewerage in five Latin-American countries (Argentina, Costa Rica, Chile, Dominican Republic and Uruguay). Dieguez, Llach and Petrecolla (1991) estimate of the net subsidy associated to the argentine social policy, disaggregating expenditure by the most relevant categories.

Several papers analyze in detail aspects of the impact of social expenditure on personal income distribution taking as a geographical unit Argentina or certain provinces (Ahumada *et al*., 1994, Flood *et al*., 1994, Gasparini and Porto, 1995, Gasparini *et al*., 2001, Porto and Cont, 1998, Ministry of Economics (1999, 2002), Bertranou and Bonari, 2003, CEDLAS-DGSC, 2004, and Feldman and Filc, 2007), or concentrating on specific expenditures (Paqueo and Lee, 2000). Others study the existence of complementarities or trade-offs created by fiscal policy on personal and regional distribution of income in a federal system. For example, Porto (1990) and Porto and Sanguinetti (1993, 2001) find evidence of a strong regional redistribution throughout the revenue sharing regime. Porto (1990) and Artana and Lopez Murphy (1995) suggested opposite effects of government budgets on personal and regional distribution of income in Argentina. Porto and Cont (1998), Cont, Peluffo and Porto (2009) and Cont and Porto (2010) are antecedents of this paper.

Finally, we make a point brought by Padovano (2007). The scope of the "fiscal residuum" methodology –used in this and many other papers– only registers the "first round" of regional redistribution, but does not capture the successive rounds set in motion by the first. These successive rounds driven by market forces may be of greater magnitude than, and eventually of opposite sign to, the first round. For example, interregional transfers could affect the functioning of factor and product markets and, in this way, reverse the results of the first round. On the one hand, the transfers can increase the cost of labor in poor provinces affecting their relative competitiveness in the national market. If the effect of transfers on private demand of labor in these provinces is negative, they will become more and more transfer-dependent. On the other hand, as transfers subsidize income rather than production in poor provinces, firms in richer and more productive regions will see the demand for their products indirectly subsidized. See Capello *et al*. (2009) for an application to Argentina.

3. Methodology.

We follow the traditional methodology of benefit-incidence analysis from, among others, Musgrave and Thin (1948), Musgrave (1964), and Reynolds-Smolensky (1977). We apply the methodology to consolidate –national and provincial– public budget in several steps. First, we must provide an ordering of individuals according to a measure of *ex ante* income distribution (that is, income before national and provincial fiscal policies). Second, we must identify and distribute both national and provincial expenditures and revenues to each individual or group of income in each province. In this step we distinguish between source and destination in the revenue sharing regime. Third, the *ex post* income is the initial income after adding expenditure benefits and deducting net taxes. The final step is the comparison between the *ex ante* and *ex post* distributions of income, i.e., those before and after fiscal policies of both levels of government, with some methodology. Given that the objective of this paper is to study the impact of fiscal policy on the regional and personal distribution of income, we use the Gini index of inequality, the Atkinson index of inequality, and the calculation of the welfare level in each province by using the Atkinson index of welfare.

3.1. Income and distribution of income.

We present income distribution in each province by dividing households into five groups (quintiles) of population. We take the distribution of per capita household income from the Permanent Household Survey (*Encuesta Permanente de Hogares*), or PHS, published by the National Bureau of Statistics (INDEC) for year 2004 (average of for quarterly surveys), and expand the reported incomes by a factor such that the total income from the PHS equals the Gross Domestic Product (GDP, which equals $11,700, or approximately US$3,900, per capita).[52] We allocate the GDP by jurisdiction according to estimates by ECLAC, in order to determine total group income in each province. Finally, we divide the expanded income by group population to determine per capita income by quintiles in each province, which is the starting point to assess income distribution.[53] Table A.1 in the Appendix presents the per capita income and income distribution in each province. Differently from the mainstream in income distribution analysis, we do not correct

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52. We report the information in domestic currency (argentine pesos). The exchange rate to the US dollar was around $3/dollar in year 2004.
53. Throughout the paper we treat gross product and ex ante income as the same. There is a significant difference between them depending on the subject under study. In this case, we consider appropriate to use GDP as a measure of ex ante income because we deduct taxes and add expenditures to obtain ex post income. In others cases, it may be more appropriate to use a definition of household net income (that is, after taxes and subsidies).

this income by equivalent adult. The main reason is the purpose of the study, which adds expenditures and taxes to get an ex post income.[54]

3.2. National and provincial budgets and their distribution.

We study the impact of the national and provincial budgets on the distribution of income using budget information for year 2004,[55] considering the allocation of expenditures, taxes and the national revenue sharing system at regional (provinces) and personal (quintiles) levels.

The national budget represents around 46% of nation-province consolidated public expenditures and 76% of taxes, excluding social security according to data from the Secretariat of Treasury.[56] The national budget ended with a surplus in year 2004, and we made changes to make it balance, following a principle that current taxes will be spent in the future (distributed by categories as in the year under study) and that current deficits will be closed by future taxes (according to the same tax scheme as in the year under study).[57] This assumption introduces a conflict in the interpretation of debt services as a public expenditure with distributional impact, and therefore it is also excluded from the analysis.[58] The statistics for natio-

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54. This kind of correction may lead us to take many other factors into consideration, such as, for example, how to convert a peso spent in public administration or education by "equivalent beneficiary", in addition to all the assumptions done to distribute such expenditures following a benefit principle.

55. We approximate the solution to the impact of national fiscal policy on income distribution as the estimation, for each income group, of the income before and after fiscal policy, both at the same existing equilibrium.

56. The reason to exclude the social security system is that these payments are, in a significant part, devolution of previous beneficiary contributions. Additionally, the location of the beneficiaries is not a policy variable. The redistributive impact of the system is beyond the scope of this paper.

57. Specifically, in the case of the national budget we increased expenditure proportionally across provinces and categories. Provincial budgets ended with a surplus with the exception of two provinces. We made the following changes to make it balance. Since the surplus balance still held even excluding two provincial-revenue lines (revenues from asset sales and property income), we closed the balance, first, by deleting these two revenue lines, and second, by increasing provincial expenditure proportionally by categories. In two provinces, Formosa and Tucumán, we closed the deficit by increasing provincial taxes proportionally to close the gap (in those provinces, asset sales and property income were irrelevant).

58. There are two plausible reasons to exclude public debt services. The first one is that the concept of beneficiaries differs significantly from the other expenditure categories (receiver of a payment vs. receiver of a benefit). The second one is that, in case of considering the direct beneficiaries of debt interests, it is not clear whether they reside in the country or abroad. It must be recalled that, following the methodology of this paper, these services correspond to a certain debt issued in the past, which was used to finance some particular expenditure, and that in the year under study additional taxes were collected to pay for such services.

nal and provincial revenues and expenditures are reported in Tables A.2, A.3 and A.4, and are explained in the Appendix.

Figure 1 may be helpful to understand the fiscal flows at the provincial level. The national government spends funds in, and collects taxes from, each province and household (flows (1) and (2) in the Figure), redistributing resources both at personal and geographical dimensions. The effect of provincial budgets on regional and personal income distribution arises through the interaction of (3) to (6) in Figure 1. By construction, total national transfers by source (3) equal total national transfers by destination (4), but some provinces are net receivers (that is, they receive in transfers more than they contribute through national taxes collected in their jurisdiction) and others are net financers.

Figure 1: Source and destination of funds in provincial budgets.
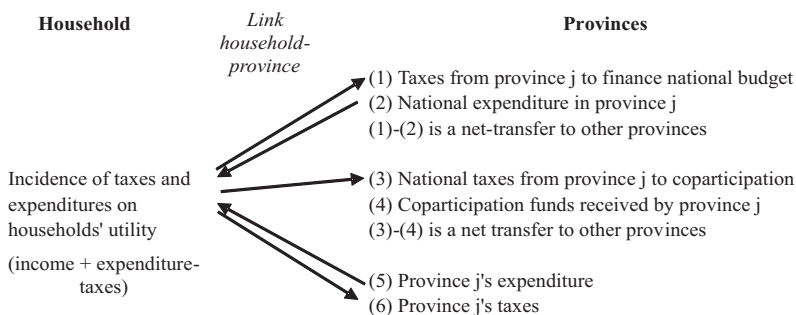
Note: surplus or deficits are assumed to be zero

As a final step, we calculate an *ex post* income. By following the standard procedure, the allocation of expenditures and taxes among quintiles in a province exhaust the national and provincial budgets.

3.3. Conceptual framework for measurement. [59]

The measurement of the impact of fiscal policy on income distribution can be done as a standard comparative statics exercise between ex ante and ex post income distributions, where the ex post income is the ex ante income plus expenditure less taxes, for every household in each province. In this paper fiscal policy includes expenditures and taxes at the national and provincial levels of governments, which are inter-linked through the national revenue sharing regime.

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59. Part of this framework is adapted from Ahumada et al. (1996).

Formally, consider a province n with i households (labeled $n=1,\ldots,N$ and $i=1,\ldots,I$, respectively). For simplicity, $I=5$ and $N=24$ reflect the case of quintiles in the Argentine provinces). The national government collects revenues from (c) taxes subject to sharing regimes (VAT, income taxes, excise taxes, etc.), labeled t_{cn}, of which retains a share β, and other (r) non-shared taxes (taxes on exports), indexed with the subscript t_{cn}, to finance national expenditure. National expenditures are allocated by categories (k) and provinces, i.e., g_{Nkn}. The contribution of the province n to the revenue sharing regime is $(1-\beta)\,\Sigma_c\,t_{c,n}$ and receives (d_n). Provincial governments receive these transfers (d_n) and also collect provincial taxes (t_{sn}) to finance provincial expenditures, also allocated in j categories, g_{Pjn}.

The national budget is

$$\sum_n \sum_k g_{Nkn} = \sum_n \left\{ \beta \sum_c t_{cn} + \sum_r t_{rn} \right\}$$

Province n's budget is

$$\sum_j g_{Pjn} = \sum_s t_{sn} + d_n$$

Let m_{in} be the individual (quintil) income before national and provincial fiscal policies. The individual benefits from the national (provincial) budget depending on the distributional patterns of taxes and expenditures. Let national expenditure g_{Nkn} be distributed according to weights γ_{ikn}, provincial expenditure g_{Pjn} be distributed with weights γ_{ijn}, national taxes t_{cn} and t_{rn} be collected with weights τ_{icn} and τ_{irn}, and provincial taxes with weights τ_{isn}.[60] Finally, let c_{in} be the ex-post individual (quintil) income in province n, which, by construction is,

$$c_{in} = m_{in} + \sum_k \gamma_{ikn} \cdot g_{Nkn} + \sum_j \gamma_{ijn} \cdot g_{Pjn} - \sum_c \tau_{icn} \cdot t_{cn} - \sum_r \tau_{irn} \cdot t_{rn} - \sum_s \tau_{isn} \cdot t_{sn}$$

or put more simply,

$$c_{in} = m_{in} + g_{iNn} + g_{iPn} - t_{iNn} - t_{iPn} \tag{1}$$

Personal income distribution is altered if $c_{in} \neq m_{in}$. It is clear from the description here that both national and provincial governments, by choosing the levels and mix of taxes and expenditures, affect personal income, as it is summarized in (1).

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60. The matrix T_{Nn} (i × c+r) summarizes the national tax weights; the matrix B_{Nn} (i × k) summarizes the national expenditures weights; the matrix T_{Pn} (i × s) summarizes provincial tax weights and the matrix B_{Pn} (i × j) summarizes provincial expenditures weights. In all the cases, the sum of the weights adds one.

Regional income distribution is altered through two channels. The first one comes from the tax-sharing regime associated to the provincial budgets. Provinces contribute to national taxes for an amount $a_n = (1-\beta) \Sigma_c \, t_{c,n}$, but receive d_n through the tax-sharing regime (cum discretional national transfers). A province is a "net financer" o "loser" ("net receiver" or "winner") in the revenue sharing system if $a_n > d_n$ ($a_n < d_n$), taking into account that $\Sigma_c \, a_n - \Sigma_c \, d_n = 0$. The second source of regional redistribution comes from the national budget. Taxes collected in a province are not necessarily spent in the same province. Therefore a province is a net financer (net receiver) in the national budget if

$$g_{Nn} <(>) \beta \sum_c t_{cn} + \sum_r t_{rn} \tag{2}$$

The effects of national and provincial fiscal policies on income distribution are summarized as follow:

(a) Level effects on income in each province (regional redistribution):

1. Redistribution through the revenue sharing system (a_n vs d_n);
2. Redistribution through the national budget (expression (2)).

(b) Effects on the personal distribution of income:

3. Distribution among quintiles i ($i = 1…5$) in province n of the benefits of national expenditures (g_{iNn}).
4. Distribution among quintiles i ($i = 1…5$) in province n of the benefits of provincial expenditures (g_{iPn}).
5. Incidence on quintil i in province n of national taxes (t_{iNn}).
6. Incidence on quintil i in province n of provincial taxes (t_{iPn}).

The household (quintil) i in province n benefits from fiscal policy (at both levels of government) if $c_{in} > m_{in}$, which results from the interaction of national and provincial expenditures and taxes, and the revenue sharing regime.

When analyzing income distribution, we will use taxes and expenditures incorporated in equation (1) to calculate Gini coefficients of income inequality. For a given jurisdiction (country or province), this coefficient is calculated as

$$G = 1 + \frac{1}{I} - 2\sum_{i=1}^{I} \frac{(I+1-i)\,y_i}{I^2 y^P} \tag{3}$$

where income groups are ranked from lowest ($i=1$) to highest ($i=5$). $I=5$, given that we work with quintiles, $y = m,\ c$ (that is, ex ante or ex post income), and y^P is the average income of the group under analysis. To assess the impact of fiscal policy on income distribution we use the indicator proposed by Reynolds and Smolensky (1977). The application of this indicator to a particular jurisdiction is

$$RSp = -\frac{1}{1 - t_N - t_P + g_N + g_p}\left(t_N Kt_N + t_P Kt_p + g_N Kg_N + g_P Kg_P\right) \quad (4)$$

where t_N (t_P) is national (provincial) tax effort, g_N (g_P) is national (provincial) expenditure, all relative to income, Kt_N (Kt_P) is the Kakwani index of national (provincial) taxes (equal to the difference between the concentration of taxes and (3)) and Kg_N (Kg_P) is the Kakwani index of national (provincial) expenditures (equal to the difference between (3) and the concentration of expenditures). For the aggregate of N jurisdictions the RSp is

$$RSp = -\left(t_N Kt_N + t_P Kt_P + g_N Kg_N + g_P Kg_P\right)$$

where, by construction, $t_N + t_P = g_N + g_P$.

We are also interested in the distinction between the regional and personal distribution of income. For that reason, we also calculate the (ex ante and ex post) Atkinson index and evaluate significant differences with the Gini coefficient. The Atkinson index is defined as

$$D(\alpha) = 1 - \frac{y*}{y^P}, \quad \text{where} \quad y* = \left(\frac{1}{I}\sum_{i=1}^{I} y_i^\alpha\right)^{1/\alpha} \quad (5)$$

where α is the inequality aversion coefficient, which takes values less than or equal to 1 (with a corresponding transformation if $\alpha = 0$). To focus on the welfare effect of fiscal policy, we calculate the net effect using a per-capita Atkinson-like welfare function.

$$W(...y_i...) = \left(\sum_{i=1}^{I} y_i^\alpha\right)^{1/\alpha} = \left(1 - D(\alpha)\right)y^P \quad (6)$$

where $y = c, m$ and the sum of weighted incomes corresponds to households in a province or in a country.

Many issues arise from the effect of public policy on income (1) and its application to (2)-(6). First, they reveal the importance of considering the regional factor in an analysis of impact of fiscal policy on income distribution, not only because each region may have different ex ante income, but also because they may have their own incidence patterns for national taxes and expenditures, in addition to different level and mix of expenditures (g_{Nkn} and g_{Pjn}), taxes (t_{cn}, t_{rn}, and t_{sn}), and the position of net financer or net receiver through national budget (equation (2)) and the revenue sharing regime ($d_n <=> a_n$).

Second, a full analysis of equation (1) must include all expenditures and taxes to assess the impact of fiscal policy on income distribution. After the rupture of the

principle of coincidence between benefit and ability to pay, both theoretical and empirical studies engaged in a first stage of partial analysis (biased to taxes), but later it was recognized that the tax and expenditure problems could not be treated separately. From the distributional standpoint, it is of little worth to count with a progressive expenditure if it is financed with very regressive taxes. Along the same lines, a social expenditure (the focus of many research papers on public policy and income distribution) may be progressive but total expenditure may be regressive, turning the partial analysis incomplete and misleading. In fact, the theory of state failure visualizes that expenditures, or a share of them, are tilted towards groups that take over the fiscal apparatus. Although it is difficult to quantify this effect beyond ad hoc assumptions on leakages, the inclusion of all expenditures –with their own distribution pattern– may help to understand the problem in a more complete way. For the same reasons it is necessary to include all taxes (legislated and non-legislated) since the tax structure (tax base, deductions, exemptions, and tax rates) are the result of a political-economics equilibrium. Then we must consider the *regional dimension*, because personal income, taxes and expenditures are not uniformly distributed across regions.

In sum, this paper estimates the impact of fiscal policy on income distribution following the standard literature, calculating some of the typical progressivity indexes for expenditures, taxes and distributional impact. Then, it advances in two directions, usually omitted by the standard literature: (i) the consideration of both sides of the budget –revenues and expenditures– for the two levels of government considered; (ii) the consideration of the regional impact of national budget and the revenue sharing system.

4. Results.

4.1. Preliminaries.

Tables A.1 and A.2 in the Appendix summarize average income, national and provincial expenditures and revenues (those necessary to finance national expenditure and the revenue sharing system). Provinces in Argentina are different in many dimensions. For an average per capita income of $11,710, the richest province's per capita income (Santa Cruz, with $34,743) is almost eight times the poorest one (Formosa, with $4,377).

These differences are also present in expenditures and revenues. National expenditure allocated by province ranges from more than 20% of provincial income (in Corrientes and Formosa) to 5% of provincial income (in Tierra del Fuego and Neuquén). Provincial expenditures also show large differences among provinces. The consolidated expenditure averages 22% of income, ranging 14% of income in the City of Buenos Aires to more than 60% in Formosa y La Rioja.

From the revenue side, Chubut outstands with a national tax burden (a part of which finances national expenditure and the difference goes back to provinces through revenue sharing) of 25% of income, followed by San Juan, Salta and Santa Fe, with a burden of nearly 20% of income. In addition to national taxes, the provinces collect local taxes ranging from very low levels of nearly 3% (Corrientes and Córdoba) to over 11% (Santa Cruz and Neuquén). The consolidated revenues average 22%, but display less regional variance, ranging from 10% in Catamarca to 35% in Chubut.

4.2. Regional redistribution: The effects of national budget and the revenue sharing regime.

Table A.3 shows regional transfers through national budget and the tax-sharing regime. Figure 2 summarizes regional differences due to these two mechanisms. In order to calculate the residuals, we decompose national revenues by source (reported in Table A.2) in those that finance national expenditure (column (5) in Table A.3) and those that revert to provinces through the revenue sharing system (column (2) in Table A.3).

Figure 2: Regional redistribution through the national budget and the revenue sharing regime (% of provincial income, 2004).
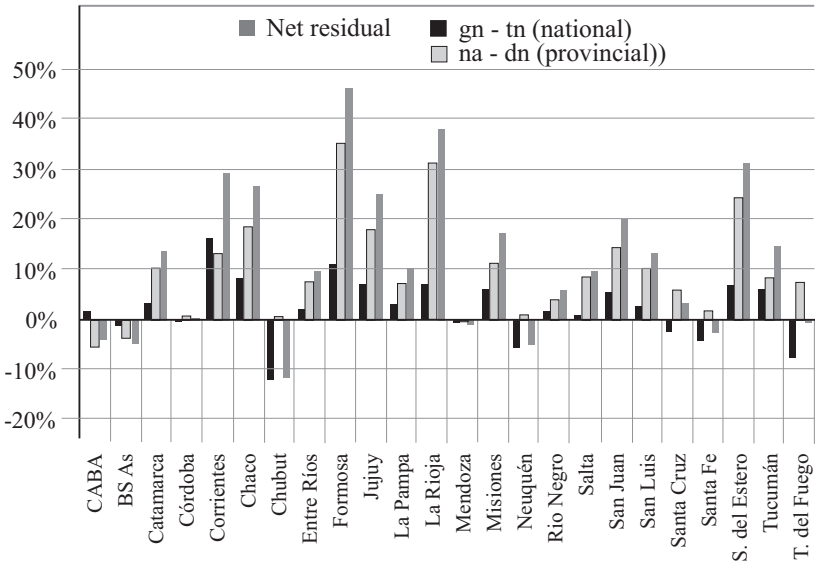
Seven jurisdictions are identified as net financers (see column (8) of Table A.3), from a combination of eight net financers from the national budget and three net

financers from the tax sharing regime. The provinces of Buenos Aires and, to a little extent, Mendoza are losers at both levels of budget –national budget and revenue sharing– (this can be observed in columns (4) and (7) of Table A.3). In Chubut, Neuquén, Santa Fe and Tierra del Fuego, the regional deficit through national budget is not compensated by the regional surplus through the provincial budget, while the opposite case occurs in the city of Buenos Aires. On the other hand, two more cases (Córdoba and Santa Cruz) are net receivers, as the result of being losers in the national budget but winners through revenue sharing.

A new ranking of provinces emerges after the execution of national and provincial budgets (see columns (1) and (9) in Table A.3). Most remarkable changes are the relative improvement in Corrientes, Formosa (both in three positions) and Jujuy (two positions) and the relative worsening of Misiones, Tucuman (both in three positions) and Salta (two positions). Twelve provinces move in just one position.

4.3. Personal redistribution: The effects of national and provincial fiscal policies.

Figure 3 reports ex ante and ex post values for income distribution and per capita income at the national level, while Tables A.4 and A.5 present the same information at the provincial level (Table A.5 also reports the distribution of revenues and expenditures by quintiles).

Figure 3: Argentina: Effects of national and provincial fiscal policies. Ex ante and ex post income distribution and per capita income (quintiles). Year 2004.

Income distribution (quintiles)	Quintil 1	Quintil 2	Quintil 3	Quintil 4	Quintil 5	Total
Income distribution (share per quintil)						
. ex ante.	3.0	6.6	11.3	22.7	56.4	100
. ex post.	5.5	8.6	12.6	23.0	50.2	100
- contrib. national budget.	0.9	0.6	0.6	0.4	-2.4	
- contrib. provincial budget.	1.7	1.3	0.7	0.0	-3.7	
Per capita income (pesos per quintil)						
. ex ante.	1,780	4,043	6,816	12,363	32,764	11,710
. ex post.	3,288	5,234	7,605	12,555	29,187	11,710
- contrib. national budget.	520	371	349	191	-1,403	
- contrib. provincial budget.	988	820	440	1	-2,174	

Source: own elaboration. The ex ante income distribution aggregates households from the nth quintil in Argentina (mixing different quintiles from different provinces). The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household resides.

At the aggregate level, the net effect of national and provincial budgets on income distribution is a clear shift of income-value from the highest-income quintil to the other lower-income quintiles. At the provincial level quintiles 1st to 3rd are better off in all provinces. The 4th quintil is worse off in six jurisdictions (city of Buenos Aires, Buenos Aires, Chubut, Neuquén, Río Negro and Tierra del Fuego). The 5th quintil is significantly better off in one province (Formosa) and slightly better off in other five provinces (Catamarca, Corrientes, Chaco, Jujuy and Santiago del Estero).

Given that a quintil in the national income distribution includes (not necessarily the same) quintiles of several provinces that are affected differently by the interaction of national and provincial budgets, we show in Figure 4 the reallocation of households across quintiles. The interpretation of the figures is similar to that of a transition matrix. In the case of households belonging to the poorest quintil before fiscal policy, 18% moves to quintil 2 and 82% remain in the same group. Similarly, in the case of households belonging to the second quintil, fiscal policy moves 4% to the next quintil and 8% to the lower quintil. No household belonging to the richest quintil descends a position, so the negative effect of consolidated budgets on their income is not enough to make high-income households move back in the income distribution.

Figure 4: Argentina: Transition of households across quintiles due to national and provincial fiscal policies. Year 2004.

	Quintil 1 (ep)	Quintil 2 (ep)	Quintil 3 (ep)	Quintil 4 (ep)	Quintil 5 (ep)
Quintil 1 (ea)	82%	18%			
Quintil 2 (ea)	8%	88%	4%		
Quintil 3 (ea)		5%	86%	10%	
Quintil 4 (ea)			4%	89%	7%
Quintil 5 (ea)					100%

Source: own elaboration, based on Table A.4.

By construction, taking quintiles in each jurisdiction as individual units (which makes 120 groups), the reordering is more remarkable: 10 groups rise more than 10 positions (with quintil 1 in La Rioja leading the change in 25 positions and quintil 1

in Tierra del Fuego ascending 21 positions), 8 groups ascend between 5 and 10 positions, 21 groups descend between 5 and 10 positions, and 4 groups drop more than 10 positions (quintiles 1 and 2 in Buenos Aires lead with 12 positions). Groups belonging to provincial quintil 5 ascend at most 1 position (Catamarca) and descend at most 5 positions (San Juan).

But there are no "absolute" filtrations in income distribution, i.e., it is not the case that poor households in rich provinces finance rich households in poor provinces. This effect is only relative.

For example, the net effect of fiscal policy ("monetized" income increase) on the income of the richest quintil in Formosa ($ 1,500) is less than the lowest effect on the poorest quintil in the group of 8 richest provinces ($ 1,747 in quintil 1 of Mendoza), but more than the effect on the poorest quintil in middle-income provinces ($ 937 in quintil 1 of Buenos Aires, $ 1,392 in quintil 1 of Córdoba), despite the difference in the initial levels of income ($ 12,000 vs. values near $ 2,000).

Moreover, it exceeds the income increase in quintil 2 of the City of Buenos Aires ($1,283) and Mendoza ($ 999). At the level of quintil 4 there are more relative changes: for example, this group from Formosa is better off by $ 2,004 which exceeds the positive effect on quintil 1 of Mendoza ($ 1,747) and quintiles 2 of the City of Buenos Aires, Mendoza and Chubut ($ 1,557). Similar results can be obtained for quintil 4 of Jujuy, Santiago del Estero, Corrientes, Chaco and San Juan.

4.4. The effect of national and provincial fiscal policies on inequality and welfare.

In this section we follow the standard methodology to assess the effect of national and provincial fiscal policies on inequality and welfare. Figure 5 summarizes the inequality coefficients for Argentina, and Tables A.6 and A.7 in the Appendix show the details at the jurisdiction level.

At the aggregate level, the fiscal policy of both levels of govenment is a progressive redistributive tool, under all coefficients of measurement considered (Gini or Atkinson). For example, the Gini coefficient indicates a reduction of 0.078 points out of an inequality value of 0.496.

The change in inequality measured by the Reynolds-Smolensky coefficient, is due to a strong effect from the expenditure side (high K_g in both levels of government), which more than overcomes the regressive effect of taxes (negative K_t also in both levels of government) collected to finance it.

**Figure 5: Inequality, progressivity and income redistribution.
Argentina 2004.**

Inequality indexes, Gini and Atkinson		
	ex ante	ex post
Gini	0.496	0.418
Atkinson ($\alpha = 0{,}5$)	0.211	0.147
Atkinson ($\alpha = -1$)	0.600	0.423
Atkinson ($\alpha = -10$)	0.821	0.670

Reynolds-Smolensky coefficient, and Kakwani coefficients for expenditures and taxes		
	Value	Contribution to change in Gini
		expenditure
Kg_N	0.363	*37%*
$g_N/(1-t+g)$	0.096	
Kg_P	0.486	*63%*
$g_P/(1-t+g)$	0.123	
		revenue
Kt_N	-0.073	*75%*
$t_N/(1-t+g)$	0.165	
Kt_P	-0.076	*25%*
$t_P/(1-t+g)$	0.054	
RSp	**-0.078**	

The ex ante income distribution aggregates households from the nth quintil in Argentina (mixing different quintiles from different provinces). The ex post income distribution is calculated based on household income after having added expenditures and subtracted revenues from the jurisdiction in which the household resides.

In section 2 we discussed the potential incompatibility of the policies of the two levels of government, as an argument for the centralization of the redistributive policy in the head of national government. Figure 5 indicates that both national and provincial fiscal policies go in the direction of improving the personal distribution of income. Provincial policy represents 63% of the impact of public expenditure on income distribution, while national policy represents 75% of the impact of taxes on income distribution. Moreover, the provincial budget (that is, provincial expendi-

tures, provincial taxes and national taxes to finance provincial expenditures) has more impact than national budget representing 64% of the change in the Gini coefficient (see Table A.8).

Given the relevance of progressivity in expenditures in the results, as shown by the Kakwani indexes K_{gN} and K_{gP}, Figure 6 reports the Kakwani index for several categories of expenditure. Two main results can be obtained from the Figure. First, there is no incompatibility between national and provincial expenditure policies, at least at this level of analysis (the same result holds for revenues). Second, provincial expenditure is more progressive than national expenditure, both at the aggregate level and at almost all categories (with the exception of Economic Services and Welfare Programs).

Figure 6: Kakwani progressivity index for expenditure categories.

Expenditure category	National government	Provincial government
General administration	0.374	0.435
Justice	0.045	0.288
Defense and Safety	0.195	0.294
Culture and Education	0.313	0.594
Health	0.252	0.590
Economic services	0.265	0.264
Welfare programs	0.831	0.699
Total expenditure	0.363	0.486

At the provincial level, the change in Gini coefficient ranges from -0.031 to -0.202. In the majority of cases, the progressive effect is the combination of progressive expenditures and regressive taxes (with some particular exceptions of progressive national taxes), as it can observed in Tables A.7 and A.8. But even though the consolidated fiscal policy is progressive in all jurisdictions, there are significant changes in the ranking of provinces (taking the Gini index as reference). Some provinces scale up 10 or more positions (Corrientes, Formosa, Chaco, San Juan

and Santiago del Estero) and others scale down 8 or more positions (Santa Cruz, Santa Fe, Mendoza, Córdoba, Buenos Aires and the City of Buenos Aires).

For those provinces that are net financers in the public budget process. In such jurisdictions, there is a trade-off between the positive impact of fiscal budget on inequality and the negative "level effect" in average income. Figure 7 assesses the net effect of fiscal budget using the Atkinson index of welfare for several assumptions on inequality-aversion for selected jurisdictions (we add the index for Argentina), and Table A.9 presents the results for all jurisdictions.

The welfare index decreases with fiscal policy for high values of α in only two (city of Buenos Aires y Chubut) of those net-financing provinces with high negative residual (Chubut, Neuquén, Santa Fe y Tierra el Fuego). However, the loss in income is quickly overcome as inequality aversion becomes important.

Figure 7: Welfare assessment for selected jurisdictions.

Jurisdiction	Atkinson (α = 0.5)		Atkinson (α = - 1)		Atkinson (α = -10)	
	ex ante	ex post	ex ante	ex post	ex ante	ex post
City Bs As (CABA)	26,370	26,115	14,659	17,441	6,685	9,841
Buenos Aires	8,776	8,810	4,970	6,159	2,221	3,321
Chubut	16,973	16,230	10,189	12,626	4,746	7,373
Mendoza	10,187	10,742	5,919	7,953	2,734	4,779
Neuquén	19,368	19,750	10,417	13,810	4,610	7,585
Santa Fe	9,940	10,327	5,847	7,846	2,635	4,541
Tierra del Fuego	23,015	24,974	13,918	20,535	6,542	14,236
Argentina	**9,237**	**9,992**	**4,685**	**6,752**	**2,091**	**3,859**

<u>Source</u>: own elaboration.

5. Conclusions and final comments.

This paper studies the impact of national and provincial fiscal policies on income distribution. Two relevant dimensions of income distribution, personal and regional, are captured in the analysis at the provincial level.

At the aggregate level, the fiscal policy of both levels of government is a progressive redistributive tool, under all coefficients of measurement considered (Gini or Atkinson). For example, the Gini coefficient indicates a reduction of 0.078 points out of an inequality value of 0.496.

At the aggregate level, the national budget has positive impact on the personal income distribution and account for 36% of the change in the Gini coefficient. The positive impact results from a combination of progressive expenditures and slightly regressive taxes. Theses impacts are different at the level of each province. In eight provinces the difference between expenditures and taxes is negative so that they are losers or net financers in the geographic redistribution. The net effect of national budget on personal distribution, however, is positive for all the provinces.

At the level of provincial budgets, which account for 64% of the change in the Gini coefficient, the positive distributive impact of subnational expenditures and taxes interact with the revenue-sharing regime, reinforcing progressivity in net-receiving provinces but creating a trade-off between progressivity and (negative) regional transfer in net-financing ones. In the latter provinces, however, the net effect of provincial budget is also progressive.

After comparing the effects of national and provincial public budgets, we conclude that there is no incompatibility between the redistributive policies at both levels of government, with the most important impact coming from (i) provincial budgets and (ii) provincial and national expenditure.

Some final comments are in order. First, the basic data is scarce and in some cases not very reliable. In particular we use gross domestic product that in several provinces could have large differences with the disposable income. Second, the estimates of incidence weights of taxes and expenditures (the $_{ikn}$, γ_{ijn}, τ_{icn}, τ_{irn} and τ_{isn}) imply very strong assumptions –many of them taken from other papers– and therefore the effects of fiscal budget on regional and personal distribution of income should be taken carefully. Nevertheless, we believe that the magnitude of the estimated effects is a good approximation of the real effects. Third, it is very probable that the effects change every year because of different composition and distribution of some kind of expenditures (e.g., capital expenditures) or taxes (e.g., export taxes on oil, gas, agricultural products and their manufactures). Fourth, we assumed the same equilibrium before and after fiscal policy. However, there are tax costs through excess burden and efficiency costs in the public provision of goods and services (e.g., spillovers or leakages), which we do not address here and leave open for future research.

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Appendix.

The dataset consist of gross geographical product (taken from ECLAC), distributed by quintiles using the ex ante distribution of income from CEDLAS-UNLP.

Information on the national public budget for the year 2004 is taken from the Secretariat of Treasury at the Ministry of Economics. The distribution of the national expenditures to the provinces is taken from the Ministry of Economics (1999, 2000, 2002). Information on provincial budgets for the year 2004 is taken from the National Bureau of Fiscal Coordination with Provinces, Secretariat of Treasury, at the Ministry of Economics.

In order to determine the impact of taxes on different groups of households (classified into five income categories, according to provincial per capita household income), we use the following assumptions:

Provincial taxes:

- Turnover, property and automobiles tax. We use the criteria presented in FIEL (1999), p. 361.
- Stamp taxes: 75% as property tax and 25% by population and income.
- Royalties: by population.

National taxes:

- Taxes included in the revenue sharing system are distributed among the provinces in order to reflect the source (incidence) of revenues. We use the assumptions made in FIEL (1999), p. 530. Then we assign taxes by quintiles using the criteria proposed by FIEL (1999), p. 361.
- Taxes on export are distributed following Gómez Sabaini and Rossignolo (2008) in the case of agricultural based manufactures. Taxes on export of petroleum products are assigned to the highest quintil.
- Other items (such as non-tax revenues, sales of state owned goods and services, leasing rents) are distributed on a per capita basis.
- Capital resources are distributed according to income.

For each category of expenditure we allocate the values based on different sources of information and assumptions (we distinguish between nation and provinces whenever it is necessary):

- General administration: per total expenditure.
- Justice: 50% per income and 50% per population.
- Transfers to municipal governments (provincial expenditure): 35% according to use of urban services, 18% per users of the Public Health System, 8% by the distribution of welfare and the remainder is distributed evenly between population and the result of the previous allocation.
- Defense and Safety: 50% per income and 50% per population.
- Education:
    - National expenditure: basic education based on the number of pre-school, primary and high school students attending public institutions.

- ◁ Provincial expenditure: based on the number of students attending public schools.
- Culture, Science and Technology: per population.
- Health: based on the number of individuals who are not beneficiaries of a private health insurance program.
- Health Insurance programs – Attention and services (national expenditure): CEDLAS (2004), Table 6.25.
- INSSJyP – Attention and services (national expenditure): PAMI program
- Social security (provincial expenditure): per number of individuals that belong to the provincial social security system.
- Water and sewerage: 75% by users of the service and 25% by population.
- Housing: according to beneficiaries of loans for housing construction.
- Welfare: according to the number of beneficiaries of different welfare programs (nutrition, clothing, etc.).
- Work and unemployment (national expenditure): 50% per number of individuals unemployed and 50% per beneficiaries of *Jefas and Jefes* program.
- Work (provinces): per number of individuals unemployed.
- Other urban services: based on the use of urban services (paved roads, sewerage, public lighting and refuse collection).
- Family allocations (national expenditure): CEDLAS (2004), Table 11.9.
- Primary production: among land owners.
- Energy, fuel and mining: according to consumption of energy and fuels.
- Industry: according to consumption of industrial products.
- Transport and communication services: 1/3 according to total consumption of goods, 1/3 according to expenditure on automobile and 1/3 according to tourism expenditures.

The weight matrices B_{Nn}, B_{Pn}, T_{Nn} and T_{Pn} are available upon request.

Política fiscal y distribución personal y regional del ingreso en la Argentina

Table A.1: Per capita income (gross geographical product) and income distribution, by province. Values in Argentine pesos. Year 2004.

Jurisdiction	Quintil 1		Quintil 2		Quintil 3		Quintil 4		Quintil 5		Total
	pc income	% of income	pc income	% of income	pc income	% of income	pc income	% of income	pc income	% of income	pc income
1 Ciudad Bs As	5,691	3.6%	12,798	8.0%	21,453	13.5%	34,761	21.9%	84,369	53.0%	31,817
2 Buenos Aires	1,891	3.6%	4,550	8.7%	7,473	14.3%	11,656	22.3%	26,585	51.0%	10,434
3 Catamarca	2,880	3.6%	6,218	7.8%	10,305	13.0%	16,193	20.4%	43,611	55.1%	15,852
4 Córdoba	2,195	3.9%	4,788	8.5%	7,875	14.0%	12,730	22.6%	28,721	51.0%	11,263
5 Corrientes	959	3.7%	2,016	7.7%	3,225	12.3%	5,609	21.4%	14,369	54.9%	5,237
6 Chaco	1,117	4.2%	2,142	8.2%	3,314	12.6%	5,397	20.5%	14,259	54.4%	5,251
7 Chubut	4,040	4.0%	9,235	9.3%	14,296	14.3%	22,300	22.2%	49,659	50.2%	19,966
8 Entre Ríos	1,384	3.7%	3,264	8.7%	5,391	14.4%	8,394	22.4%	19,057	50.8%	7,502
9 Formosa	799	3.6%	1,761	8.0%	2,924	13.4%	4,362	19.9%	12,022	55.0%	4,377
10 Jujuy	1,262	4.4%	2,424	8.5%	3,821	13.3%	6,095	21.3%	15,014	52.5%	5,725
11 La Pampa	2,303	3.5%	5,908	9.0%	9,972	15.2%	15,203	23.2%	31,977	49.0%	13,083
12 La Rioja	1,582	5.0%	2,878	9.1%	4,271	13.5%	6,845	21.5%	16,169	51.0%	6,353
13 Mendoza	2,328	3.9%	5,235	8.7%	8,497	14.1%	13,511	22.3%	30,853	51.1%	12,089
14 Misiones	1,273	4.7%	2,364	8.7%	3,918	14.4%	5,866	21.6%	13,708	50.5%	5,426
15 Neuquén	3,925	3.3%	9,299	7.9%	15,616	13.3%	26,718	22.7%	61,675	52.7%	23,469
16 Río Negro	2,164	4.2%	4,131	8.2%	6,401	12.6%	10,412	20.5%	27,627	54.4%	10,150
17 Salta	1,008	3.2%	2,023	6.5%	3,414	10.9%	6,189	19.8%	18,634	59.6%	6,257
18 San Juan	1,184	4.1%	2,487	8.6%	3,986	13.9%	5,889	20.4%	15,205	53.0%	5,756
19 San Luis	2,987	5.1%	5,475	9.4%	8,853	15.2%	13,467	23.1%	27,486	47.2%	11,656
20 Santa Cruz	7,302	4.2%	16,232	9.3%	27,559	15.9%	39,624	22.8%	82,918	47.8%	34,743
21 Santa Fe	2,243	3.9%	5,376	9.3%	8,740	15.1%	13,642	23.5%	28,066	48.3%	11,616
22 Santiago del Estero	723	3.0%	1,681	7.0%	3,003	12.5%	5,083	21.1%	13,555	56.5%	4,816
23 Tucumán	1,089	3.9%	2,351	8.5%	3,662	13.2%	5,869	21.1%	14,776	53.3%	5,555
24 Tierra del Fuego	5,570	4.1%	12,617	9.3%	19,235	14.3%	26,629	21.9%	67,995	50.4%	27,024
Argentina	1,780	3.0%	4,043	6.6%	6,816	11.3%	12,363	22.7%	32,764	56.4%	11,710

Source: Own estimates based on INDEC, ECLAC and Secretary of Treasury, Ministry of Economics.

Table A.2: National and provincial expenditures and taxes, by province. Values in per capita Argentine pesos and as a

Jurisdiction	National Expenditure		Provincial Expenditure		Consolidated (N+P) Expenditure		National Revenues (source)		Provincial Revenues (source)		Total Revenues (source)	
	$ pc	% GGP	$ pc	% GGP	$ pc	% GGP	$ pc	% GGP	$ pc	% GGP	$ pc	% GGP
1 City Bs As (CABA)	2,841	8.9%	1,651	5.2%	4,492	14.1%	4,303	13.5%	1,434	4.5%	5,737	18.0%
2 Buenos Aires	910	8.7%	1,028	9.9%	1,939	18.6%	1,861	17.8%	572	5.5%	2,433	23.3%
3 Catamarca	1,020	6.4%	2,777	17.5%	3,797	24.0%	934	5.9%	697	4.4%	1,632	10.3%
4 Córdoba	1,060	9.4%	1,237	11.0%	2,297	20.4%	1,852	16.4%	398	3.5%	2,251	20.0%
5 Corrientes	1,303	24.9%	1,245	23.8%	2,548	48.7%	848	16.2%	174	3.3%	1,022	19.5%
6 Chaco	875	16.7%	1,612	30.7%	2,488	47.4%	831	15.8%	262	5.0%	1,093	20.8%
7 Chubut	1,448	7.3%	3,195	16.0%	4,643	23.3%	4,944	24.8%	2,029	10.2%	6,973	34.9%
8 Entre Ríos	899	12.0%	1,600	21.3%	2,499	33.3%	1,377	18.4%	411	5.5%	1,788	23.8%
9 Formosa	893	20.4%	2,053	46.9%	2,946	67.3%	764	17.4%	162	3.7%	926	21.2%
10 Jujuy	924	16.1%	1,632	28.5%	2,556	44.6%	887	15.5%	238	4.2%	1,125	19.6%
11 La Pampa	1,212	9.3%	2,536	19.4%	3,748	28.7%	1,731	13.2%	681	5.2%	2,412	18.4%
12 La Rioja	1,131	17.8%	2,791	43.9%	3,921	61.7%	1,213	19.1%	300	4.7%	1,513	23.8%
13 Mendoza	968	8.0%	1,356	11.2%	2,324	19.2%	1,806	14.9%	631	5.2%	2,437	20.2%
14 Misiones	890	16.4%	1,355	25.0%	2,246	41.4%	994	18.3%	321	5.9%	1,314	24.2%
15 Neuquén	1,187	5.1%	4,220	18.0%	5,406	23.0%	3,398	14.5%	3,153	13.4%	6,551	27.9%
16 Río Negro	1,140	11.2%	1,951	19.2%	3,091	30.5%	1,808	17.8%	711	7.0%	2,519	24.8%
17 Salta	883	14.1%	1,232	19.7%	2,115	33.8%	1,232	19.7%	291	4.7%	1,523	24.3%
18 San Juan	980	17.0%	1,660	28.8%	2,640	45.9%	1,208	21.0%	293	5.1%	1,501	26.1%
19 San Luis	1,041	8.9%	2,242	19.2%	3,283	28.2%	1,253	10.7%	514	4.4%	1,766	15.2%
20 Santa Cruz	2,390	6.9%	7,130	20.5%	9,520	27.4%	4,315	12.4%	4,049	11.7%	8,365	24.1%
21 Santa Fe	999	8.6%	1,408	12.1%	2,407	20.7%	2,234	19.2%	493	4.2%	2,727	23.5%
22 Santiago del Estero	781	16.2%	1,626	33.8%	2,407	50.0%	723	15.0%	184	3.8%	906	18.8%
23 Tucumán	911	16.4%	1,438	25.9%	2,350	42.3%	1,056	19.0%	480	8.6%	1,537	27.7%
24 Tierra del Fuego	1,329	4.9%	6,033	22.3%	7,362	27.2%	4,780	17.7%	2,667	9.9%	7,447	27.6%
Argentina	1,120	9.6%	1,443	12.3%	2,563	21.9%	1,930	16.5%	633	5.4%	2,563	21.9%
Standard deviation	0.43	0.55	1.06	0.81	0.70	0.65	0.70	0.23	1.64	0.51	0.90	0.22
Max/Min	3.6	5.1	6.9	9.0	4.9	4.8	6.8	4.2	25.0	4.0	9.2	3.4

Source: Own estimates based on INDEC and Secretary of Treasury, Ministry of Economics. Public budgets exclude national social security and debt services. Note: "pc" is per capita. "GGP" is gross geographic product, which is the measure of provincial income used in this document.

Table A.3: Regional impacts of the national budget and the revenue sharing regime, by province. Values in per capita Argentine pesos. Year 2004.

Jurisdiction	Ex ante income (1)	National revenues to provincial budgets (source) (2)	National transfers (dest.) (3)	Difference (provincial) (4)	National revenues to national budget (source) (5)	National Expenditure (6)	Difference (national) (7)	Difference (N+P) (8)	Ex post income (9)
1 City Bs As (CABA)	31,817	1,976	217	-1,758	2,327	2,841	514	-1,245	30,572
2 Buenos Aires	10,434	835	456	-378	1,027	910	-116	-494	9,939
3 Catamarca	15,852	455	2,080	1,625	480	1,020	540	2,165	18,018
4 Córdoba	11,263	778	838	60	1,074	1,060	-14	46	11,309
5 Corrientes	5,237	392	1,071	679	456	1,303	847	1,526	6,762
6 Chaco	5,251	381	1,350	969	450	875	426	1,395	6,646
7 Chubut	19,966	1,091	1,166	75	3,853	1,448	-2,405	-2,330	17,635
8 Entre Ríos	7,502	632	1,188	557	745	899	154	711	8,213
9 Formosa	4,377	356	1,891	1,535	408	893	485	2,020	6,397
10 Jujuy	5,725	371	1,394	1,023	515	924	408	1,431	7,156
11 La Pampa	13,083	924	1,855	932	807	1,212	405	1,336	14,419
12 La Rioja	6,353	529	2,490	1,961	683	1,131	447	2,408	8,761
13 Mendoza	12,089	768	725	-43	1,038	968	-70	-113	11,976
14 Misiones	5,426	431	1,035	604	563	890	327	931	6,358
15 Neuquén	23,469	876	1,067	191	2,522	1,187	-1,335	-1,144	22,325
16 Río Negro	10,150	850	1,240	390	959	1,140	182	572	10,722
17 Salta	6,257	413	941	528	820	883	63	592	6,848
18 San Juan	5,756	546	1,367	821	663	980	317	1,139	6,894
19 San Luis	11,656	532	1,729	1,197	720	1,041	320	1,517	13,173
20 Santa Cruz	34,743	1,090	3,080	1,990	3,225	2,390	-835	1,156	35,899
21 Santa Fe	11,616	740	915	175	1,495	999	-495	-320	11,296
22 Santiago del Estero	4,816	277	1,442	1,165	445	781	335	1,501	6,316
23 Tucumán	5,555	487	958	471	569	911	342	813	6,368
24 Tierra del Fuego	27,024	1,373	3,366	1,994	3,407	1,329	-2,078	-85	26,939
Argentina	11,710	810	810	0	1,120	1,120	0	0	11,710
Standard deviation	0.48	0.93			0.92	0.43			
Max/Min	7.1	15.5			9.4	3.6			

Source: Own estimates based on INDEC and Secretary of Treasury, Ministry of Economics.

Table A.4: Per capita income (pre and post national and provincial budgets). Values in Argentine pesos. Year 2004.

Jurisdiction	Quintil 1		Quintil 2		Quintil 3		Quintil 4		Quintil 5	
	ex ante	ex post	ex ante	ex post	ex ante	ex post	ex ante	ex post	ex ante	ex post
1 City Bs As (CABA)	5,691	8,383	12,798	14,081	21,453	19,657	34,761	30,226	84,369	80,503
2 Buenos Aires	1,891	2,828	4,550	5,200	7,473	7,496	11,656	11,261	26,585	22,901
3 Catamarca	2,880	6,058	6,218	9,027	10,305	13,010	16,193	18,298	43,611	43,645
4 Córdoba	2,195	3,588	4,788	5,867	7,875	8,624	12,730	13,298	28,721	25,165
5 Corrientes	959	3,672	2,016	3,940	3,225	4,736	5,609	6,835	14,369	14,626
6 Chaco	1,117	3,177	2,142	4,238	3,314	4,917	5,397	6,607	14,259	14,268
7 Chubut	4,040	6,280	9,235	10,792	14,296	14,663	22,300	21,033	49,659	35,245
8 Entre Ríos	1,384	3,145	3,264	4,966	5,391	6,365	8,394	8,830	19,057	17,743
9 Formosa	799	2,884	1,761	4,008	2,924	5,184	4,362	6,366	12,022	13,527
10 Jujuy	1,262	3,360	2,424	4,391	3,821	5,462	6,095	7,451	15,014	15,110
11 La Pampa	2,303	5,533	5,908	8,481	9,972	12,131	15,203	16,288	31,977	29,622
12 La Rioja	1,582	5,469	2,878	6,227	4,271	7,129	6,845	9,113	16,169	15,854
13 Mendoza	2,328	4,075	5,235	6,234	8,497	8,921	13,511	13,549	30,853	27,084
14 Misiones	1,273	2,865	2,364	3,611	3,918	4,933	5,866	6,743	13,708	13,634
15 Neuquén	3,925	6,460	9,299	11,318	15,616	16,439	26,718	25,888	61,675	51,435
16 Río Negro	2,164	4,744	4,131	5,775	6,401	7,457	10,412	9,843	27,627	25,780
17 Salta	1,008	2,479	2,023	3,480	3,414	4,532	6,189	6,899	18,634	16,839
18 San Juan	1,184	3,379	2,487	4,147	3,986	5,413	5,889	7,022	15,205	14,489
19 San Luis	2,987	6,434	5,475	7,401	8,853	10,828	13,467	14,393	27,486	26,797
20 Santa Cruz	7,302	12,697	16,232	20,011	27,559	29,554	39,624	40,706	82,918	76,456
21 Santa Fe	2,243	3,868	5,376	6,506	8,740	9,153	13,642	13,773	28,066	23,172
22 Santiago del Estero	723	2,916	1,681	3,673	3,003	4,704	5,083	6,385	13,555	13,874
23 Tucumán	1,089	2,946	2,351	3,910	3,662	4,805	5,869	6,541	14,776	13,618
24 Tierra del Fuego	5,570	12,202	12,617	15,989	19,235	21,743	29,629	28,364	67,995	56,347
Argentina	1,780	3,288	4,043	5,234	6,816	7,605	12,363	12,555	32,764	29,187

Source: own elaboration.

Table A.5: Distribution of income (pre and post national budget), revenue and expenditure, year 2004.

Jurisdiction	Quintil 1						Quintil 2						Quintil 3						Quintil 4						Quintil 5					
	ex ante	tax N	tax P	exp N	exp P	ex post	ex ante	tax N	tax P	exp N	exp P	ex post	ex ante	tax N	tax P	exp N	exp P	ex post	ex ante	tax N	tax P	exp N	exp P	ex post	ex ante	tax N	tax P	exp N	exp P	ex post
1 City Bs As (CABA)	3.6	7.9	6.2	17.5	28.5	5.5	8.0	11.8	11.0	17.8	25.3	9.2	13.5	21.5	21.9	19.4	20.0	12.9	21.9	29.1	30.4	19.3	14.2	19.8	53.0	29.6	30.6	26.0	12.0	52.7
2 Buenos Aires	3.6	7.9	6.3	17.9	20.2	5.7	8.7	10.9	10.3	17.4	22.7	10.5	14.3	14.5	15.3	17.9	19.3	15.1	22.3	18.2	20.4	21.4	17.7	22.7	51.0	48.5	47.8	25.5	20.1	46.1
3 Catamarca	3.6	8.8	8.5	16.7	21.8	6.7	7.8	10.8	11.1	18.6	19.8	10.0	13.0	14.1	15.1	20.0	20.7	14.5	20.4	18.2	20.3	20.8	18.7	20.3	55.1	48.0	45.1	24.0	18.9	48.5
4 Córdoba	3.9	7.6	6.5	17.8	20.8	6.3	8.5	10.4	10.5	18.0	21.0	10.4	14.0	13.5	14.7	20.6	19.4	15.3	22.6	17.2	19.8	24.6	20.2	23.5	51.0	51.3	48.5	19.0	18.6	44.5
5 Corrientes	3.7	10.4	7.4	29.7	20.6	10.9	7.7	10.4	8.9	18.1	20.2	11.6	12.3	14.2	13.7	16.4	18.7	14.0	21.4	18.3	20.5	16.4	17.9	20.2	54.9	46.6	49.5	19.4	22.5	43.3
6 Chaco	4.2	10.6	7.5	19.7	21.5	9.6	8.2	10.7	8.8	19.5	22.3	12.8	12.6	14.7	13.9	18.3	19.8	14.8	20.5	18.3	19.7	19.1	17.2	19.8	54.4	45.8	50.1	23.5	19.1	43.0
7 Chubut	4.0	4.4	15.4	18.7	22.0	7.1	9.3	6.1	16.8	20.4	20.6	12.2	14.3	7.7	18.1	16.9	18.1	16.6	22.2	14.0	22.8	21.0	18.7	23.7	50.2	67.9	26.9	23.0	20.6	40.4
8 Entre Ríos	3.7	8.4	7.4	17.9	21.0	7.6	8.7	10.7	10.8	20.3	21.8	12.1	14.4	14.1	15.8	18.9	17.8	15.6	22.4	18.4	21.9	19.8	15.8	21.5	50.8	48.4	44.1	23.1	23.6	43.2
9 Formosa	3.6	10.4	9.3	17.8	17.2	9.0	8.0	11.4	11.2	19.6	18.5	12.5	13.4	14.6	15.3	19.0	20.4	16.2	19.9	19.3	20.7	19.3	19.9	19.9	55.0	44.3	43.4	24.2	24.1	42.4
10 Jujuy	4.4	10.4	7.8	18.0	22.3	9.4	8.5	11.6	10.2	20.1	20.6	12.3	13.3	14.7	14.6	19.3	19.3	15.3	21.3	19.1	21.0	20.4	18.5	20.8	52.5	44.1	46.4	22.2	19.4	42.2
11 La Pampa	3.5	7.4	7.6	20.1	22.9	7.7	9.0	10.9	12.0	19.7	21.5	11.8	15.2	14.3	16.4	21.0	21.1	16.8	23.2	20.5	22.5	20.8	18.7	22.6	49.0	47.0	41.5	18.4	15.8	41.2
12 La Rioja	5.0	7.6	6.4	20.0	23.7	12.5	9.1	10.3	10.6	19.8	21.6	14.2	13.5	12.5	14.2	20.0	19.4	16.3	21.5	16.2	20.9	19.7	17.6	20.8	51.0	53.4	47.9	20.6	17.7	36.2
13 Mendoza	3.9	6.9	11.1	17.8	27.5	6.8	8.7	9.6	13.8	17.0	21.7	10.4	14.1	12.5	17.0	18.6	17.5	14.9	22.3	15.8	20.6	21.1	16.1	22.6	51.1	55.2	37.6	25.5	17.2	45.3
14 Misiones	4.7	9.0	7.7	20.8	18.2	9.0	8.7	10.7	10.3	17.8	17.0	11.4	14.4	13.9	14.8	18.2	16.7	15.5	21.6	18.0	20.7	18.6	18.8	21.2	50.5	48.4	46.5	24.7	29.2	42.9
15 Neuquén	3.3	4.5	16.3	20.5	22.1	5.8	7.9	5.9	17.3	18.3	22.1	10.1	13.3	7.8	18.4	18.5	18.7	14.7	22.7	13.3	21.6	19.6	17.4	23.1	52.7	68.4	26.4	23.1	19.6	46.2
16 Río Negro	4.2	7.2	10.9	20.1	25.3	8.8	8.2	10.6	14.0	18.9	20.8	10.8	12.6	13.8	16.8	17.8	19.3	13.9	20.5	26.7	25.9	19.5	17.0	18.4	54.4	41.6	32.4	23.7	17.6	48.1
17 Salta	3.2	7.5	8.3	16.5	21.5	7.2	6.5	8.3	9.8	18.6	20.9	10.2	10.9	11.0	13.8	19.2	18.6	13.2	19.8	15.4	20.4	20.0	17.4	20.2	59.6	57.8	47.8	25.7	21.5	49.2
18 San Juan	4.1	8.8	6.7	18.2	23.3	9.8	8.6	11.6	10.7	16.6	20.5	12.0	13.9	14.7	15.2	19.6	19.0	15.7	20.4	18.1	20.5	21.2	17.9	20.4	53.0	46.8	46.9	24.5	19.2	42.1
19 San Luis	5.1	8.8	7.3	19.2	28.4	9.8	9.4	11.7	11.6	17.2	18.4	11.2	15.2	14.9	16.3	19.3	20.7	16.4	23.1	18.7	22.1	21.1	14.0	21.9	47.2	45.9	42.7	23.2	18.5	40.7
20 Santa Cruz	4.2	4.6	14.6	17.8	20.2	7.1	9.3	6.5	16.2	19.4	17.2	11.1	15.9	9.7	18.9	18.5	16.0	16.5	22.8	16.3	23.9	21.8	19.2	22.7	47.8	62.9	26.3	22.5	27.4	42.6
21 Santa Fe	3.9	6.5	6.8	18.9	22.3	6.8	9.3	8.9	11.0	18.0	21.3	11.5	15.1	11.9	15.6	17.5	17.8	16.2	23.5	15.0	20.5	20.6	18.2	24.4	48.3	57.6	46.2	25.0	20.3	41.0
22 Santiago del Estero	3.0	10.3	7.8	21.5	22.1	9.2	7.0	10.9	9.0	18.5	21.5	11.6	12.5	14.4	13.6	19.3	19.6	14.9	21.1	19.3	20.3	18.2	18.1	20.2	56.5	45.0	49.3	22.5	18.7	44.1
23 Tucumán	3.9	9.2	6.4	17.7	23.5	9.2	8.5	11.3	9.9	18.4	21.6	12.3	13.2	13.9	13.9	18.2	19.2	15.1	21.1	18.6	21.0	20.6	16.9	20.5	53.3	47.0	48.8	25.0	18.8	42.9
24 Tierra del Fuego	4.1	4.9	12.3	23.5	26.0	9.0	9.3	7.1	15.0	19.6	19.1	11.9	14.3	8.4	16.4	17.4	18.4	16.2	21.9	17.4	26.7	19.6	17.1	21.0	50.4	62.2	29.7	19.8	19.4	41.9
Argentina	3.0	6.4	5.0	15.7	19.1	5.5	6.6	8.4	9.2	14.7	19.7	8.6	11.3	12.1	12.5	17.8	18.5	12.6	22.7	19.6	23.3	22.3	22.0	23.0	56.4	53.5	50.1	29.5	20.7	50.2

Source: own elaboration.

Table A.6: Gini and Atkinson coefficients of inequality. Year 2004.

Jurisdiction	Gini				Atkinson (φ=0,5)				Atkinson (φ=-1)				Atkinson (φ=-10)			
	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg	ex ante	Rkg	ex post	Rkg
1 City Bs As (CABA)	0.451	9	0.420	1	0.171	7	0.146	1	0.539	6	0.430	1	0.790	5	0.678	1
2 Buenos Aires	0.434	13	0.372	5	0.159	12	0.114	5	0.524	8	0.380	3	0.787	6	0.666	2
3 Catamarca	0.462	4	0.376	3	0.180	4	0.116	3	0.543	5	0.355	4	0.787	7	0.606	5
4 Córdoba	0.433	14	0.358	6	0.157	15	0.104	6	0.509	13	0.350	5	0.771	13	0.628	4
5 Corrientes	0.465	3	0.294	21	0.181	3	0.073	18	0.545	4	0.223	22	0.785	9	0.391	23
6 Chaco	0.451	7	0.296	19	0.170	8	0.074	17	0.504	14	0.229	20	0.750	19	0.442	20
7 Chubut	0.421	17	0.311	13	0.150	18	0.080	13	0.490	18	0.284	11	0.762	15	0.582	9
8 Entre Ríos	0.432	16	0.322	11	0.158	14	0.085	11	0.519	10	0.280	12	0.783	10	0.551	11
9 Formosa	0.459	5	0.296	20	0.178	5	0.073	20	0.538	7	0.234	18	0.786	8	0.473	15
10 Jujuy	0.436	12	0.297	18	0.158	13	0.072	21	0.485	19	0.231	19	0.741	21	0.453	19
11 La Pampa	0.421	18	0.311	14	0.151	17	0.078	14	0.523	9	0.272	13	0.793	4	0.550	12
12 La Rioja	0.418	21	0.216	24	0.144	22	0.039	24	0.446	23	0.131	24	0.708	23	0.288	24
13 Mendoza	0.433	15	0.357	7	0.157	16	0.103	7	0.510	12	0.336	7	0.774	11	0.601	6
14 Misiones	0.418	20	0.311	15	0.145	20	0.078	15	0.460	22	0.251	14	0.725	22	0.476	14
15 Neuquén	0.454	6	0.375	4	0.175	6	0.115	4	0.556	3	0.381	2	0.804	3	0.660	3
16 Río Negro	0.451	8	0.344	8	0.170	9	0.101	8	0.504	15	0.292	10	0.750	20	0.488	13
17 Salta	0.505	1	0.376	2	0.215	1	0.116	2	0.599	1	0.346	6	0.811	2	0.576	10
18 San Juan	0.438	11	0.292	22	0.161	11	0.070	22	0.499	16	0.223	23	0.758	16	0.432	22
19 San Luis	0.391	24	0.290	23	0.126	24	0.068	23	0.421	24	0.225	21	0.699	24	0.439	21
20 Santa Cruz	0.403	23	0.331	9	0.137	23	0.089	9	0.471	21	0.304	9	0.753	18	0.585	8
21 Santa Fe	0.413	22	0.325	10	0.144	21	0.086	10	0.497	17	0.305	8	0.773	12	0.598	7
22 Santiago del Estero	0.484	2	0.313	12	0.200	2	0.081	12	0.598	2	0.251	15	0.824	1	0.463	17
23 Tucumán	0.446	10	0.302	16	0.167	10	0.075	16	0.515	11	0.237	17	0.770	14	0.460	18
24 Tierra del Fuego	0.421	19	0.299	17	0.148	19	0.073	19	0.485	20	0.238	16	0.758	17	0.472	16
Argentina	0.496		0.418		0.211		0.147		0.600		0.423		0.821		0.670	

Source: own elaboration.

Table A.7: Reynolds-Smolensky (RSp), Kakwani for expenditure (Kg) and revenues (Kt). Year 2004.

Jurisdiction	Kg_N	Rkg	g_N/ (1-t+g)	Rkg	Kg_P	Rkg	g_P/ (1-t+g)	Rkg	K_N	Rkg	t_N/ (1-t+g)	Rkg	K_P	Rkg	t_P/ (1-t+g)	Rkg	RSp	Rkg
1 City Bs As (CABA)	0.377	18	0.093	14	0.627	1	0.054	24	-0.208	24	0.141	14	-0.178	18	0.047	12	-0.031	24
2 Buenos Aires	0.357	20	0.092	15	0.454	17	0.103	23	-0.080	13	0.187	3	-0.061	4	0.058	7	-0.061	23
3 Catamarca	0.395	13	0.057	22	0.490	9	0.154	19	-0.119	18	0.052	24	-0.133	15	0.039	18	-0.087	18
4 Córdoba	0.397	12	0.094	13	0.454	18	0.109	22	-0.057	8	0.164	10	-0.060	3	0.035	19	-0.075	21
5 Corrientes	0.555	1	0.193	1	0.459	16	0.184	13	-0.143	21	0.125	16	-0.081	10	0.026	23	-0.171	3
6 Chaco	0.423	7	0.132	6	0.491	8	0.243	4	-0.139	20	0.125	17	-0.066	6	0.039	16	-0.155	5
7 Chubut	0.386	15	0.082	18	0.442	19	0.181	15	0.120	1	0.280	1	-0.307	23	0.115	2	-0.110	11
8 Entre Ríos	0.393	14	0.110	11	0.436	21	0.195	11	-0.081	14	0.168	8	-0.094	12	0.050	10	-0.110	12
9 Formosa	0.409	10	0.140	5	0.398	22	0.321	1	-0.156	22	0.119	21	-0.148	17	0.025	24	-0.162	4
10 Jujuy	0.401	11	0.129	7	0.468	15	0.228	6	-0.136	19	0.124	18	-0.084	11	0.033	21	-0.139	8
11 La Pampa	0.431	4	0.084	17	0.489	10	0.176	17	-0.065	9	0.120	20	-0.108	14	0.047	11	-0.109	13
12 La Rioja	0.414	9	0.129	8	0.483	12	0.319	2	-0.028	7	0.138	15	-0.045	1	0.034	20	-0.202	1
13 Mendoza	0.355	22	0.081	19	0.538	2	0.113	21	-0.022	6	0.151	13	-0.193	19	0.053	8	-0.076	20
14 Misiones	0.384	16	0.140	4	0.324	24	0.213	9	-0.074	11	0.156	11	-0.067	8	0.050	9	-0.108	14
15 Neuquén	0.428	5	0.053	23	0.493	7	0.189	12	0.087	3	0.152	12	-0.357	24	0.141	1	-0.079	19
16 Río Negro	0.420	8	0.106	12	0.529	4	0.182	14	-0.112	16	0.169	7	-0.232	20	0.066	6	-0.107	15
17 Salta	0.426	6	0.129	9	0.519	5	0.180	16	-0.074	12	0.180	4	-0.147	16	0.043	14	-0.129	9
18 San Juan	0.369	19	0.142	3	0.482	14	0.241	5	-0.108	15	0.175	6	-0.077	9	0.042	15	-0.146	6
19 San Luis	0.344	24	0.079	20	0.489	11	0.170	18	-0.066	10	0.095	23	-0.066	7	0.039	17	-0.101	16
20 Santa Cruz	0.356	21	0.067	21	0.338	23	0.199	10	0.103	2	0.120	19	-0.278	22	0.113	3	-0.072	22
21 Santa Fe	0.353	23	0.088	16	0.442	20	0.125	20	0.021	5	0.198	2	-0.060	2	0.044	13	-0.088	17
22 Santiago del Estero	0.478	2	0.124	10	0.526	4	0.257	3	-0.173	23	0.114	22	-0.108	13	0.029	22	-0.171	2
23 Tucumán	0.379	17	0.143	2	0.502	6	0.226	7	-0.114	17	0.166	9	-0.062	5	0.075	5	-0.144	7
24 Tierra del Fuego	0.451	3	0.049	24	0.483	13	0.224	8	0.080	4	0.177	5	-0.234	21	0.099	4	-0.121	10
Argentina	0.363		0.096		0.486		0.123		-0.073		0.165		-0.076		0.054		-0.078	

<u>Source</u>: own elaboration. Note: $t = t_N + t_P$; $g = g_N + g_P$.

Table A.8: Decomposition matrix for Gini coefficient: National and Provincial Budgets. Year 2004.

Change in Gini due to	National Expenditure	% N+P Exp	Provincial Expenditure	% N+P Exp	National Revenues	% N+P Rev	Provincial Revenues	% N+P Rev	National Budget	% N+P Budget	Provincial Buget	% N+P Budget
1 City Bs As (CABA)	-0.033	49%	-0.034	51%	0.015	41%	0.022	59%	-0.018	59%	-0.012	41%
2 Buenos Aires	-0.032	40%	-0.046	60%	0.010	57%	0.008	43%	-0.021	35%	-0.039	65%
3 Catamarca	-0.025	24%	-0.078	76%	0.005	39%	0.007	61%	-0.020	22%	-0.071	78%
4 Córdoba	-0.037	43%	-0.050	57%	0.004	39%	0.007	61%	-0.033	44%	-0.043	56%
5 Corrientes	-0.119	55%	-0.097	45%	0.013	59%	0.009	41%	-0.106	55%	-0.087	45%
6 Chaco	-0.065	34%	-0.127	66%	0.011	51%	0.011	49%	-0.054	32%	-0.116	68%
7 Chubut	-0.032	31%	-0.070	69%	-0.040		0.036		-0.072	68%	-0.034	32%
8 Entre Ríos	-0.046	35%	-0.087	65%	0.011	56%	0.008	44%	-0.035	31%	-0.078	69%
9 Formosa	-0.075	35%	-0.138	65%	0.014	52%	0.013	48%	-0.061	33%	-0.125	67%
10 Jujuy	-0.060	35%	-0.113	65%	0.014	61%	0.009	39%	-0.047	31%	-0.105	69%
11 La Pampa	-0.039	30%	-0.089	70%	0.005	36%	0.009	64%	-0.034	30%	-0.080	70%
12 La Rioja	-0.069	30%	-0.162	70%	0.002	27%	0.004	73%	-0.067	30%	-0.158	70%
13 Mendoza	-0.029	32%	-0.061	68%	0.000	2%	0.013	98%	-0.028	37%	-0.047	63%
14 Misiones	-0.059	45%	-0.073	55%	0.007	46%	0.009	54%	-0.052	45%	-0.064	55%
15 Neuquén	-0.023	21%	-0.088	79%	-0.018		0.052		-0.041	53%	-0.036	47%
16 Río Negro	-0.046	32%	-0.098	68%	0.009	25%	0.026	75%	-0.038	35%	-0.072	65%
17 Salta	-0.059	39%	-0.094	61%	0.005	26%	0.015	74%	-0.054	41%	-0.079	59%
18 San Juan	-0.060	33%	-0.122	67%	0.015	60%	0.010	40%	-0.045	29%	-0.112	71%
19 San Luis	-0.030	26%	-0.085	74%	0.004	43%	0.005	57%	-0.026	24%	-0.080	76%
20 Santa Cruz	-0.025	28%	-0.066	72%	-0.017		0.034		-0.042	57%	-0.032	43%
21 Santa Fe	-0.032	38%	-0.053	62%	-0.008		0.006		-0.039	46%	-0.047	54%
22 Santiago del Estero	-0.072	34%	-0.143	66%	0.018	66%	0.009	34%	-0.055	29%	-0.134	71%
23 Tucumán	-0.059	33%	-0.120	67%	0.013	52%	0.012	48%	-0.045	30%	-0.108	70%
24 Tierra del Fuego	-0.024	19%	-0.100	81%	-0.022		0.027		-0.046	39%	-0.073	61%
Argentina	-0.035	37%	-0.060	63%	0.007	41%	0.010	59%	-0.028	36%	-0.050	64%

Source: own elaboration. Note: "N+P" stands for national and provincial levels of government.

Table A.9: Welfare assessment for Argentine jurisdictions. Year 2004.

Jurisdiction	Atkinson (ξ =0.5)		Atkinson (ξ =1)		Atkinson (ξ =10)	
	ex ante	ex post	ex ante	ex post	ex ante	ex post
1 City Bs As (CABA)	26,370	26,115	14,659	17,441	6,685	9,841
2 Buenos Aires	8,776	8,810	4,970	6,159	2,221	3,321
3 Catamarca	13,001	15,931	7,249	11,621	3,383	7,103
4 Córdoba	9,490	10,133	5,526	7,352	2,579	4,211
5 Corrientes	4,288	6,266	2,384	5,252	1,126	4,122
6 Chaco	4,360	6,157	2,605	5,126	1,311	3,707
7 Chubut	16,973	16,230	10,189	12,626	4,746	7,373
8 Entre Ríos	6,318	7,517	3,608	5,910	1,626	3,690
9 Formosa	3,600	5,932	2,021	4,901	938	3,375
10 Jujuy	4,821	6,638	2,946	5,501	1,482	3,917
11 La Pampa	11,102	13,287	6,244	10,499	2,706	6,490
12 La Rioja	5,437	8,415	3,517	7,616	1,858	6,234
13 Mendoza	10,187	10,742	5,919	7,953	2,734	4,779
14 Misiones	4,639	5,859	2,929	4,760	1,495	3,332
15 Neuquén	19,368	19,750	10,417	13,810	4,610	7,585
16 Río Negro	8,429	9,643	5,037	7,594	2,541	5,494
17 Salta	4,909	6,051	2,507	4,481	1,184	2,902
18 San Juan	4,829	6,409	2,885	5,358	1,390	3,918
19 San Luis	10,184	12,275	6,748	10,211	3,508	7,390
20 Santa Cruz	29,990	32,712	18,373	24,974	8,577	14,898
21 Santa Fe	9,940	10,327	5,847	7,846	2,635	4,541
22 Santiago del Estero	3,854	5,803	1,937	4,733	850	3,390
23 Tucumán	4,629	5,889	2,696	4,856	1,279	3,438
24 Tierra del Fuego	23,015	24,974	13,918	20,535	6,542	14,236
Argentina	9,237	9,992	4,685	6,752	2,091	3,859

Source: own elaboration.

Fiscal Policy and Income Distribution:
Measurement for Argentina 1995 - 2010[61]

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Resumen.

Este trabajo estudia el efecto consolidado -nación y provincias- de la política fiscal sobre la distribución personal del ingreso en la Argentina, construyendo un panel de datos para 1995-2010. La política fiscal reduce la desigualdad en la distribución del ingreso. El coeficiente de Gini disminuye en 0,06 en 1995-2001 (desde un valor exante de 0,49), y en 0,08 en 2003-2010 (desde 0,497). Los gastos (principalmente en servicios sociales) son la herramienta para la distribución ya que los impuestos son regresivos. Los gastos provinciales explican dos tercios de la reducción del Gini, significando que no hay incompatibilidad entre descentralización y redistribución. Los gastos en especie (in kind) son más importantes que las transferencias en dinero, pese al gran avance de éstas en 2003-2010. El impacto de los gas-

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tos sociales y de los impuestos sobre los ingresos es similar al encontrado en otros países de América Latina, pero significativamente menor que los resultados encontrados para los países de la OECD y de la Unión Europea. El caso argentino puede ser útil para otros países federales, en particular, considerando todos los gastos e impuestos y las responsabilidades de los distintos niveles de gobierno.

Palabras clave: presupuestos gubernamentales, diferencias inter-jurisdiccionales, efecto redistrubutivo.

JEL: H77, H73, I38

Abstract:

This paper studies the effect of consolidated –national and provincial– fiscal policy on personal income distribution in Argentina, building a novel panel data for 1995-2010. We find that fiscal policy reduces income inequality, summarized with the Gini coefficient, by 0.06 in 1995-2001 (out of an ex ante average value of 0.490), and 0.08 in 2003-2010 (out of 0.497). Expenditures (mainly social services) are the tool for redistribution because taxes are regressive. Provincial expenditures account for two-thirds of the reduction in the Gini coefficient, indicating that there is no incompatibility between decentralization and redistribution. The contribution in-kind expenditures to redistribution is more important than that of cash transfers; although the latter gain relevance in 2003-2010. The impact of social expenditures and income taxes on the Gini coefficient is similar to effects found in other Latin American countries, but significantly lower than results found for OECD and European Union countries. The case of Argentina may provide useful lessons for other federal countries, in particular, considering all the expenditures and taxes and the responsibility of the different levels of governments and their effect on income distribution.

Keywords: Government budgets; Inter-jurisdictional differentials; Redistributive effects.

JEL Classifications: H77, H73, I38.

1. Introduction.

During the last 60 years there has been a spring of theoretical and empirical research papers studying the effect fiscal policy on income distribution, of which we concentrate on (i) the subject of redistribution (personal income, rather than other definitions of income, such as regional or functional), (ii) the fiscal policy under study (consolidated budget, rather than either taxes or expenditures, or even subsets of either of them individually), and (iii) the debate on the level of government which fits better to execute fiscal policy (central, provincial, or shared role in federal systems).

This paper studies the effect of consolidated –national and provincial– fiscal policy on income distribution in Argentina. This country is an interesting case study on the three issues considered above. Firstly, the study of the effect of fiscal policy on income distribution is important in itself, because it allows policy makers to detect whether seemingly redistributive policies improve income distribution across time, and sheds light on possible ways of correction. In addition, the selected period of study in Argentina covers two socio-economic regimes, one characterized by fixed exchange rate, macroeconomic stability and tight fiscal accounts (known as "Convertibility", until year 2001), which ended up in a crisis at the beginning of year 2002, and another characterized by high real exchange rate, high inflation and slack fiscal accounts (known as "post-Convertibility", since year 2002). Secondly, being a federal country, revenue collection is highly centralized (with the central government collecting about 79 percent of total revenues in 2010) while expenditures are shared between the central and provincial governments (with provinces representing 44 percent of total expenditures in 2010). Social expenditure led the decentralization trend, after a pact was reached between the nation and provinces that allocated responsibilities on basic education (including pre-school, elementary and high school) and health to the latter. Such policy changes in three decades had significant effects on society, and in particular, on taxpayers and expenditure beneficiaries, but the measurement of such effects have always been partial (see Porto, 2012, and Galiani et al. 2008, for example). Thirdly, the exercise allows us to identify the contribution of national and provincial expenditures and taxes to redistribution and to confront the centralization-decentralization views on fiscal policy. The case of Argentina may provide useful lessons for other federal countries, in particular, considering the responsibility of different levels of governments in the allocation of fiscal variables and their effect on income distribution.

We build a novel panel data for 1995-2010 considering the 24 jurisdictions (23 provinces and the City of Buenos Aires) and quintile groups within provinces. We allocate national and provincial expenditures and taxes among people within prov-

inces, following benefit and incidence principles, and avoiding double accounting. Then we assess the distributive impact of taxes and expenditures at both national and provincial levels of governments in Argentina, by studying the evolution of three measures of personal income distribution: a) ex ante – which results from market forces; b) interim – which results from adding public cash transfers and subtracting direct taxes to a); and c) ex post –or extended– which results from adding in-kind public goods and subtracting indirect taxes to b).

We first discuss the evolution of income distribution: personal income inequality increased between 1995 and 2002 and then reverted the trend, in parallel with two different socioeconomic regimes captured in the sample (Convertibility between 1995 and 2001 and post Convertibility since 2002). Then we develop our main results: i) the effect of fiscal policy is a reduction in the Gini coefficient of 6 points in 1995-2001, and 8 points in 2003-2010; ii) the mix effect of instruments to redistribute income changed in time towards cash transfers and against in-kind expenditures; iii) provincial budgets contribute strongly to improve income distribution; iv) social expenditure is the most important redistribution tool, but economic services have grown in size between sub-periods, pushed by government subsidies in energy and transport; v) a partial effect of fiscal policy (social expenditure-income taxes) is similar to that in Latin American countries, but significantly lower than results found for OECD and European Union (EU) countries.

The paper is organized as follows. Section 2 situates the paper within the related literature. Section 3 presents the methodology and data. Section 4 summarizes the economic and social situation in Argentina, as well as the main public finance statistics. Section 5 shows the main results. Finally, Section 6 presents conclusions and recommendations.

2. Literature Context.

In the traditional normative theory one main question of analysis concerns the relevant dimension of distribution: should the aim of public policy be the regional distribution of income, the personal distribution, or both? Considering that arguments included in the welfare function are individuals' utilities, and the risks of hiding personal redistribution within regional redistribution (such as the possibility that rich people from poor regions being subsidized by poor people from rich regions; Oates, 1972), we concentrate on personal distribution.[62]

A second important question concerns the level of government in charge of income redistribution within a federal country: should the national, provincial, or lo-

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62. A more complete analysis should focus on the distribution of wealth or consumption. We do not pursue this path due to lack of consistent long-term data on such variables.

cal, or all of them, be responsible for this task? In the latter case, how to share the re-distribution responsibility among levels of government? The theoretical literature put this function on the head of the central government (Musgrave, 1959; Oates, 1972), in order to avoid the so-called competition and incompatibility problems (Tresch, 2002).[64] In spite of these two problems, the experience from most countries shows that redistribution from sub-national fiscal budgets is important (see Sewell, 1996, and more recently Hoynes and Luttmer, 2012; Baicker, Clemens and Singhal, 2012; among others). Interestingly, the last two papers study the impact of (a subset of) sub-national taxes and expenditures on income distribution explicitly. In the case of Argentina, Cont and Porto (2014) highlight the relevance of provincial budgets as a redistributive tool.

The traditional empirical literature on the impact of fiscal policy on personal income distribution followed different, and mostly partial, approaches, but using standard incidence analysis. The problem with partial approaches is that they may hide the full effect of fiscal policy and lead to incorrect policy results and recommendations. Other papers study the impact of inter-governmental transfers on income distribution (in many cases, focusing on destination of transfers, i.e., disregarding the source of funds considering that transfers are *manna*, or in a few cases, correctly including the source of funds).[64]

In the normative literature discussed so far and followed in this paper, fiscal policy is exogenous. More recent literature on political economy emphasizes the influence of different groups of interest in the design and implementation of fiscal policy. In this way, fiscal variables turn out to be endogenous results (see Person and Tabellini, 2000; Bénabou, 2000, Beramendi, 2012, among others, for studies that focus on the preferences of citizen-voters for redistribution, and Alesina and Rodrik, 1914, Alesina and Peroti, 1996, Dixit and Londregan, 1996, 1998, Bourguignon, 2004, López and Servén, 2006, Atkinson and Brandolini, 2006, Myles, 2009, Ramos and Roca-Sagalés, 2008, Roca-Sagalés and Sala, 2011, and Muinello-Gallo and Roca-Sagalés, 2013, for empirical work on endogenous relationships among fiscal policy, income distribution and income levels or growth).

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63. Pauly (1973) supported some decentralization of redistributive policies on the basis of altruism.

64. We omit a full literature review on the impact of fiscal variables on income distribution. The reader is referred to Cont and Porto (2014). In addition, see a comparison among Latin American and Western Europe countries by Goñi et al. (2008), a more recent comparison among Latin American countries by Hanni et al. (2014), or analysis concentrated on social expenditure for Argentina by Gasparini et al. (2001) or CEDLAS-DGSC (2004). In the case of transfers, we refer the reader to the pioneer papers of Bennett and Mayberry (1979), Holcombe and Zardkoohi (1981), Weingast, Shepsle and Johnsen (1981) and Inman and Ingerman (1988), and Porto and Sanguinetti (2001) for an application to Argentina.

3. Methodology and Data.

3.1 Methodology.

3.1.1 National budget, transfers and provincial budgets.

Consider a province n with i households (labelled $n = 1, \ldots, N$ and $i = 1, \ldots, I$, respectively). The national government collects revenues from taxes subject to sharing regimes (VAT, income taxes, excise taxes, etc.), labelled t_{cn}, of which retains a share β, and other non-shared taxes (e.g., taxes on exports), indexed with the subscript t_{on}, to finance national expenditure. The national government allocates expenditures (g_{Nkn}) across provinces by categories (k). Also, the national government allocates discretionary transfers among provinces (d_{dn}) with national funds. This way, the national budget is

$$\Sigma n \ \Sigma k \ g_{Nkn} + \Sigma n \ d_{dn} = \Sigma n \ \{\beta \ \Sigma c \ t_{cn} + \Sigma o + t_{on}\} \quad (1)$$

Provincial governments receive transfers according to the revenue sharing regime (d_{rn}, such that $\Sigma_n \ d_{rn} = (1-\beta) \ \Sigma_n \ \Sigma_c \ t_{cn}$) and other discretional transfers (d_{dn}), which, together with provincial taxes (t_{sn}), finance provincial expenditures that are allocated in j categories, g_{Pjn}. Province n's budget is

$$\Sigma j \ g_{Pjn} = \Sigma s \ t_{sn} + d_{rn} + d_{dn} \quad (2)$$

Both (1) and (2) assume balanced budget; otherwise, a positive (negative) difference between expenditures and resources corresponds to fiscal surplus (deficit).

3.1.2 Impact of fiscal variables on personal distribution of income.

Let min be the individual income before national and provincial fiscal policies (in this paper, we consider i as a quintile). The household benefits from the national (provincial) budget depending on the distributional patterns of taxes and expenditures. Let national expenditure g_{Nkn} be distributed according to weights γ_{ikn}, provincial expenditure g_{Pjn} be distributed with weights γ_{ijn}, national taxes t_{cn} and t_{on} be collected with weights τ_{icn} and τ_{ion}, and provincial taxes with weights τ_{isn}.[65]

Let c_{in} be the ex-post income of household i in province n, which, by construction is,

$$c_{in} = m_{in} + \Sigma k \ \gamma_{ikn} \cdot g_{Nkn} + \Sigma j \ \gamma_{ijn} \cdot g_{Pjn} - \Sigma c \ \tau_{icn} \cdot t_{cn} - \Sigma o \ \tau_{ion} \cdot t_{on} - \Sigma s \ \tau_{isn} \cdot t_{sn} \quad (3)$$

or put more simply,

$$c_{in} = m_{in} + g_{iNn} + g_{iPn} - t_{iNn} - t_{iPn} \quad (4)$$

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65. Matrix T_{Nn} (i × c+o) summarizes the national tax weights; matrix B_{Nn} (i × k) summarizes national expenditures weights; matrix TPn (i × s) summarizes provincial tax weights and matrix B_{Pn} (i × j) summarizes provincial expenditures weights. In all the cases, the sum of the weights adds one.

that is, the ex-post (extended) income is the ex-ante income plus national and provincial expenditures minus national and provincial taxes. Another relevant definition is interim income (p_{in}), i.e., personal income after deducting direct taxes (mainly, labor and income taxes) and adding direct transfers (social security payments, social transfers in cash, and others) but before in-kind expenditures and subsidies, and indirect taxes. It is clear from the description and equation (3) that both national and provincial governments affect personal income through the levels and mix of taxes and expenditures, as long as $c_{in} \neq p_{in} \neq m_{in}$. The measurement of the impact of fiscal policy on income distribution can be done as a standard comparative statics exercise between ex-ante, interim and ex-post income distributions.

3.1.3 Summary of the effects of fiscal variables on income distribution.

The effects of national and provincial fiscal policies on personal income distribution are summarized through the allocation of national and provincial expenditures and taxes to quintile i's households in province n $\{g_{iNn}, t_{iNn}, g_{iPn}, t_{iPn}\}$ in equations (3) and (4). Once taxes and expenditures are allocated, we pool households into five quintiles at the national level. Therefore, household i benefits from fiscal policy if $c_i > m_i$ (where we drop the subscript n when we refer to national quintiles), which results from the interaction of national and provincial expenditures and taxes, and the revenue sharing regime. Also, household i benefits from direct (indirect) fiscal policy if $p_i > m_i$ ($c_i > p_i$), and viceversa.

3.1.4 Gini coefficient of income inequality.

This paper uses the Gini coefficient of income inequality applied to the national distribution of income

$$G = 1 + \frac{1}{I} - 2\sum_{i=1}^{I} \frac{(I + 1 - i)y_i}{I^2 y^P} \tag{5}$$

where households are ranked from lowest to highest income. The number of income groups is $I=5$; y is the ex ante (m_i), interim (p_i) or the ex post (c_i) income; and y^P is the average income of the unit under analysis.[66] Similar mathematical formulas apply to concentration curves (expenditures and taxes). To assess the impact of fiscal policy on income distribution, we use the indicator proposed by Reynolds and Smolensky (1977)

$$RS = - \frac{\Sigma_j t_j Kt_j + \Sigma l g_l K_{gl}}{1/\Sigma_j t_j + \Sigma l g_l} \tag{6}$$

where $\{j,l\}$ capture a selected partition of taxes and expenditures. For example, if

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66.   We may underestimate inequality when we pool quintiles-provinces into quintiles-country (i.e., there is a level of within-inequality), but we do not explore it in this paper.

the consolidated budget is decomposed into national (N) and provincial (P) taxes and expenditures, then $j=l=N,P$; t_N (t_P) is the national (provincial) tax effort; g_N (g_P) is the national (provincial) expenditure, all relative to income; Kt_N(Kt_P) is the Kakwani index of progressivity of national (provincial) taxes (equal to the difference between the concentration of taxes and (5)); and Kg_N(Kg_P) is the Kakwani index of progressivity of national (provincial) expenditures (equal to the difference between (5) and the concentration of expenditures). If the consolidated budget is disaggregated into transfer and in-kind expenditures together with the corresponding taxes, a similar description follows for such decompositions (where $j=l=T,IK$). Alternatively, expenditures could be disaggregated into social, economic and administrative expenditures ($l=SS,ES,A$) and taxes could be disaggregated into production-consumption-transactions, income-assets and others ($j=PCT,IA,O$). Finally, we allow for government surplus or deficits, i.e., $\Sigma_j t_j \neq \Sigma_l g_l$.

3.2 Data.

The starting point is the level of provincial income, summarized in the Gross Geographic Product (GGP).[67] Income distribution is reported in the Permanent Household Surveys (PHS,

Encuesta Permanente de Hogares), published by the National Bureau of Statistics (INDEC, *Instituto Nacional de Estadísticas y Censos*). Given that income declared in PHS includes transfers from the government to people (cash transfers, benefits, social security payments, etc.) and excludes a subset of taxes (personal income taxes, social security contributions, etc.), it is an interim income. In order to arrive to the ex-ante income we subtract cash expenditures and add income taxes and contributions from interim income. On the other hand, starting from interim income, we add in-kind expenditures and subtract the remaining taxes –most of them, indirect taxes– to arrive to ex-post (or extended) income. Per capita figures are constructed as the ratio between the corresponding variable and population (source: INDEC).

We allocate taxes and expenditures among quintiles, by making assumptions on weights (γ_{ikn}, γ_{ijn}, τ_{icn}, τ_{ion}, τ_{isn}) as detailed in the online appendix. The construction of weights is a challenge in itself, and we apply rules that are usual in the literature (see Reynolds and Smolensky, 1977, as general reference, and Ahumada

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67. An important issue arises with the concept of income vs. product. A share of the product in a province may correspond to income from people living in other provinces, while some personal income of a household living in a province may be computed as the product produced in another province. A major problem in Argentina has to do with the product and the income generated in the city of Buenos Aires vs. the province of Buenos Aires, and also in other provinces. Since we do not know a definite sign for possible bias, we use the product variable.

et al., 1997, for an example of Argentina). Put it simply, direct taxes (on families' income and wealth) are allocated based on income patterns, and indirect taxes (on goods and services) are allocated based on consumption, production or trade patterns. On the other hand, the allocation of cash expenditures among households is quite straightforward, but the allocation of public and quasi-public goods is complex, depending on assumptions on the use of services (whenever information is available), or in proportion of income or/and population.[68] Finally, individual allocations must be consistent with national taxes collected from different provinces, national expenditures distributed among provinces (and groups of provinces), national transfers to provinces,[69] provincial taxes and provincial expenditures.

4. The Case of Argentina.

Argentina is a Latin American country with per capita income over US$ 9,000 (year 2010). Regional disparities are large, with provincial incomes ranging from US$ 27,508 in the city of Buenos Aires to US$ 3,781 in Santiago del Estero province. Such disparities also hold for social indicators such as Unsatisfied Basic Needs, although other indicators (such as Human Development Index) display less provincial heterogeneity (more details are available in the Online).

As stated in the introduction, income inequality has been a continuous concern of public policy in Argentina, having constitutional entity (National Constitution of 1994, Art. 75° inc. 2). The period 1995-2010 is very interesting in that the country moved from a stage of growth and increasing inequality, until 1998, to another of recession and increasing inequality, which ended up in a crisis at the beginning of year 2002, to later grow steadily, accompanied by reductions in inequality (see left panel of Figure 1). The first sub-period is part of the so-called Convertibility, which was a socio-economic regime characterized by fixed exchange rate, macroeconomic stability and tight fiscal accounts. The second sub-period is known as "post-Convertibility", and is characterized by high real exchange rate, high inflation and slack fiscal accounts (for expenditure and fiscal deficit, see right panel of Figure 1).

The consolidated nation-provinces expenditure oscillated between 29 percent

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68. For criticisms on allocation rules, see Schwartz and Ter-Minassian (2000).

69. Transfers to provinces are currently conformed by resources from revenue-sharing regimes ("coparticipation", education fund, services transfers, and a regional compensating fund); resources to fund social security systems (a percentage of VAT and personal assets); road, electricity infrastructure and housing funds (collected from taxes on liquid combustibles); a percentage of income tax destined to social works and the *Conurbano Fund*; specific funds (collected from taxes on personal assets and the *monotributo*); electricity fund; and non-automatic or discretionary transfers.

and 35 percent of GDP during 1995-2001, to later plummet to around 27 percent of GDP during a three-year period.[70] Since then, it grew constantly to peak 40 percent in the last year of the sample (and 45 percent in 2014). Resources kept it up to a higher pace, from 28 percent of GDP in 1995-2001 to 34 percent of GDP in 2003-2010, turning the fiscal balance from an average 4-percent deficit to an average 1-percent surplus (see right panel of Figure 1).

Figure 1. Evolution of per capita GDP (in thousands of constant Pesos of 2010), income inequality (Gini index), and consolidated –national and provincial– fiscal expenditure and balance (percent of GDP).

GDP per capita ('000 Pesos of year 2010) - left axis.
GINI (interim) - right axis.

Consolidate expenditure (as percent of GDP) - left axis.
Consolidate fiscal balance (+ surplus / - deficit) as percent of GDP - right axis.
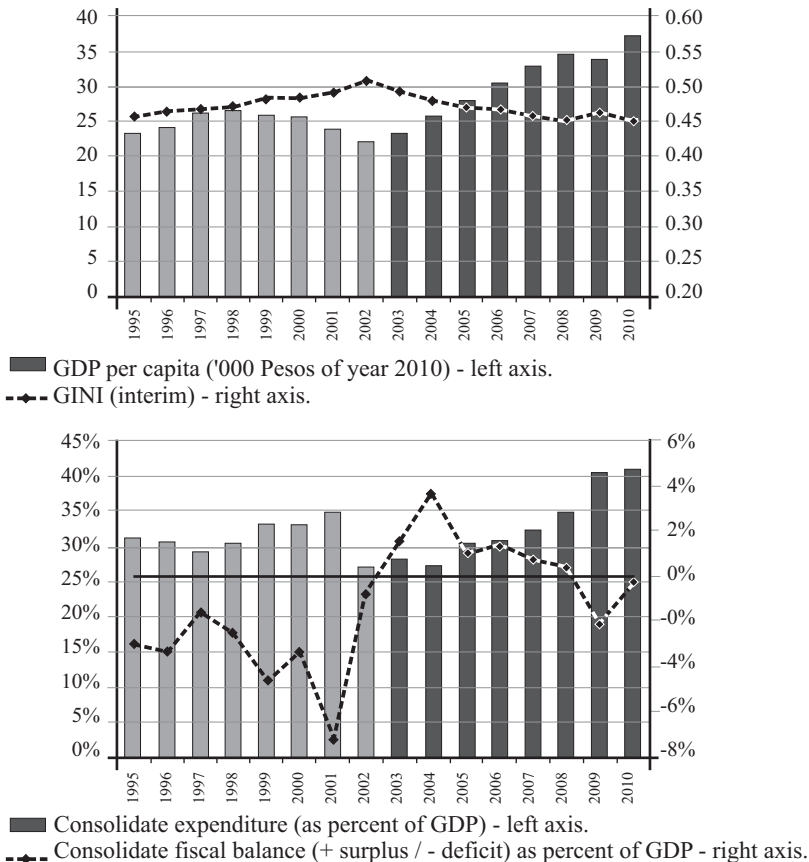
70. Municipal budget is excluded because detailed information is unavailable. They represent 8% of total expenditure in Argentina. Nonetheless, they are indirectly considered in the analysis through the transfers from provinces to municipalities (which represent about half of municipal expenditures).

Table 1. Argentina Composition of consolidated (nation-provinces) expenditures and taxes. Selected periods.

	1995-2010	1995-2001	2003-2010		1995-2010	1995-2001	2003-2010
Percent of Total Expenditure				**Percent of Total Revenues**			
	%	**%**	**%**		**%**	**%**	**%**
Administration, defense, safety.	21	22	20	Production, consumption, trade.	50	47	52
Social services.	61	60	61	- VAT.	21	23	20
- Education and health.	26	26	25	- Export taxes.	5	0	8
- Social security.	26	27	25	- Other domestic taxes.	22	21	22
- Promotion, assistance,work.	7	6	8	- Other trade taxes.	3	3	2
- Other social services.	3	2	3	Income and assets.	38	38	37
Ecomnomic services.	9	7	12	- Income + asset taxes.	15	13	17
- Energy.	2	0	3	- Social security contributions.	20	21	18
- Other economic services.	8	6	9	- Other taxes on income.	3	4	2
Debt services.	8	10	7	Other taxes.	12	15	10
Cash expenditure.	33	33	33	Taxes x cash expenditure.	25	26	24
Ink-kind expenditure.	67	67	67	Taxes x in-kind expenditure.	75	74	76
National expenditure.	54	54	53	National taxes.	76	74	77
Provincial expenditure.	46	46	47	Provincial taxes.	24	26	23

Source: own elaboration based on public national and provincial accounts.

Table 1 summarizes the evolution of expenditures and taxes through several decompositions (as shares of expenditures or taxes, respectively), comparing averages for the total sample and the two selected sub-periods. Some interesting observations emerge from this table. First, the mix of cash – in kind expenditures remained stable in 33-67 percent. Within in-kind expenditures, the sum of social spending on education and health remained stable (about 26 percent). Social security, which is mostly direct expenditure, lost 2 points of share from between 1995-2001 and 2003-2010, which was gained by direct (cash) transfers in social promotion and assistance, and work plans. Economic services increased 5 points of share in total expenditure, which is mostly subsidies on the consumption of energy (natu-

ral gas and electricity) and transport. Finally, provincial expenditure gained a 1 point of share between 1995-2001 and 2003-2010 (concentrated on social services).

On the revenue side, there is an increase in the share of taxes on production, consumption and transactions, from 47 percent of total taxes in 1995-2001 to 52 percent in 2003-2010, shifting away income and assets taxes (from 38 to 37 percent) and other taxes. Within production and transaction taxes, there is a shift from VAT (from 23 to 20 percent) to export taxes (from 0 to 8 percent). On the other hand, within direct income taxes there is a shift of social security contributions (from 21 to 18 percent), to –mostly personal– income and asset taxes (from 13 to 17 percent). Finally, taxation shifted away from provincial resources to national resources (from 74 to 77 percent).

Given this situation, we deem important to measure the distributional impact of fiscal policy given the socio-economic context of Argentina. How did it change among sub-periods? What is the effect of changes in the mix of expenditures (towards instruments that allocate cash to households) or taxes (towards direct income taxes or indirect export taxes)? What are the implications of such shifts? Are there differential contributions from the national budget vis-à-vis national budgets?

5. Results.

5.1 Gini coefficients of inequality.

Figure 2 and Table 2 present the evolution of the Gini coefficients of inequality in income distribution for Argentina, between 1995 and 2010. The first index –Gini ex ante– measures (a simulated) income inequality arising from market forces, without government intervention. This is a fictional starting point since it is widely known that market forces must coexist with a minimum provision of public goods. Also, since we started from the real situation to construct the ex-ante distribution of income, we omitted effects that would arise from removing taxes and government transfers (i.e., consumers finding other sources of income, adjusting consumption, etc.). The second index –Gini interim– measures income inequality after adding government cash expenditures (transfers and payments to households) to, and subtract corresponding taxes from, ex ante income. This is the income that households report in household surveys (like the Permanent Household Survey in Argentina). The third index –Gini ex post– adds to interim income a residuum coming from provision of in-kind public and quasi-public goods (education, health, etc.) and subtracts indirect taxes (and other direct taxes), which results in a measure of extended income.

As it was already shown in other papers, income inequality, as declared by surveyed households, increased between 1995 and 2002, then reverted the trend, although with a specific interruption in 2009 (see, for example, INDEC, 2015, and Gasparini and Cruces, 2009).[71] For example, the Gini interim increased from 0.457 in 1995 to 0.508 in 2002 and decreased to 0.451 in 2010. The evolution of the other two Gini coefficients (ex ante and ex post) is qualitatively similar to that of the Gini interim.

Table 2. Gini ex ante (market forces); Gini interim (cash transfers and direct taxes), Gini ex post (public provision, indirect taxes).

Ginis	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Gini ex ante	0.470	0.480	0.485	0.89	0.498	0.502	0.508	0.523	0.521	0.510	0.503	0.502	0.482	0.480	0.498	0.483
Gini interim	0.457	0.465	0.468	0.472	0.482	0.485	0.494	0.508	0.494	0.481	0.471	0.467	0.458	0.452	0.464	0.451
Gini ex post	0.409	0.419	0.423	0.426	0.434	0.439	0.439	0.471	0.456	0.436	0.420	0.416	0.402	0.392	0.400	0.386

Figure 2. Gini ex ante (market forces); Gini interim (cash transfers and direct taxes), Gini ex post (public provision, indirect taxes).
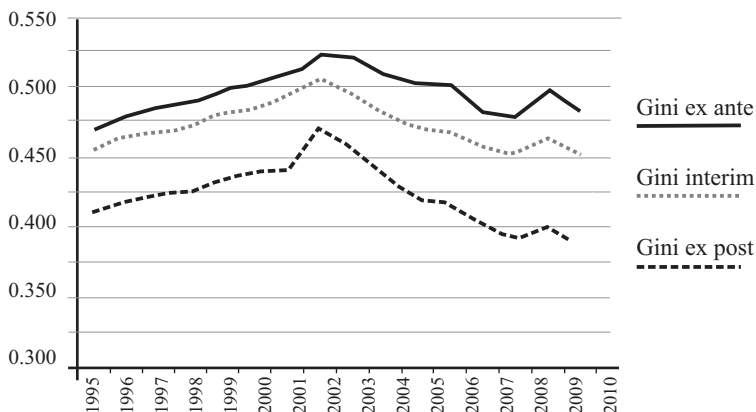
5.2. Effect of fiscal policy on income distribution:

Reynolds-Smolensky decomposition.

Figure 2 and Table 2 also show that the effect of fiscal policy is a reduction of income inequality throughout the period of analysis. Specifically, the Gini coeffi-

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71 There may be differences in levels of inequality among the references and the figures reported here, which derive from different universe of households, pooling of income groups, computation methodologies, etc., but trends do not differ.

cient decreases 6 points in 1995-2001, 5 points in 2002 (year of last macroeconomic crisis in Argentina), 8 points in 2003- 2010, stretching to 10 points in 2010. Moreover, in year 2002, fiscal policy barely compensated the inequality in 1995 (i.e., the Gini ex post in 2002 –0.471– was almost the same as the Gini ex ante in 1995 –0.470–).

In order to interpret the effect of fiscal policy (in this case, the difference between Gini coefficients) we perform a Reynolds-Smolensky decomposition.[72] Figure 3 and Table 3 show the evolution of *RStrasnfers* (which measures the change from Gini ex ante to Gini interim) and *RSinkind* (which measures the change from Gini interim to Gini ex post). Therefore, the difference between Ginis ex ante and ex post income corresponds to the sum of *RStransfers* and *RSinkind*.

Figure 3. Reynolds- Smolensky coefficient and decomposition.
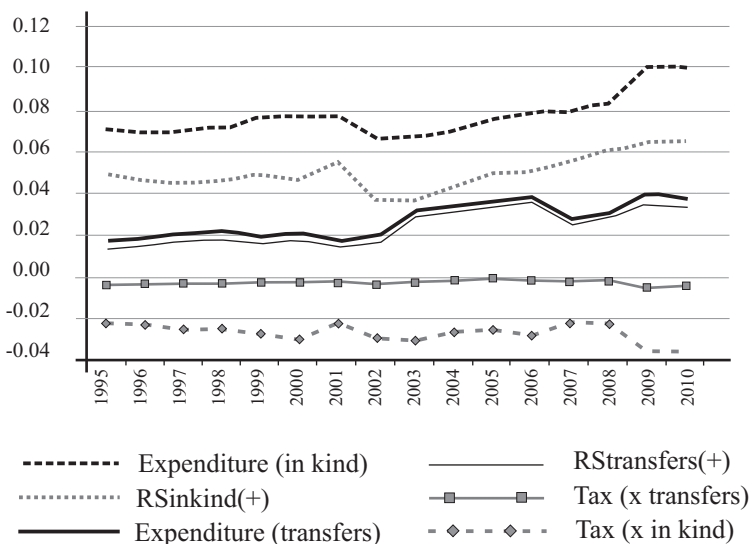
Observations about Figure 3: each line measures the contribution of expenditure (Kg * g) and taxes (Kt * t) Both *RSinkind* and *RStransfers* are positive-definite in this Figure and Table 2.

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72. Given the way we pool quintiles in provinces into national quintiles, the reordering effect from consolidate budget is almost null.

Table 3. Reynolds-Smolensky coefficient and decomposition.

Ex ante vs. Ex post	1995-2010	1995-2001	2003-2010
Kg (transfers)	0.274	0.211	0.337
g (transfers)	0.096	0.090	0.101
Transfers	**0.026**	**0.019**	**0.034**
Kg(in kind)	0.399	0.399	0.396
g (in kind)	0.194	0.184	0.208
G in kind	**0.077**	**0.073**	**0.082**
Kt (x transfers)	-0.048	-0.055	-0.038
t (x transfers)	0.068	0.061	0.075
T x transfers	**-0.003**	**-0.003**	**-0.003**
Kt (x in kind)	-0.133	-0.143	-0.119
t (x in kind)	0.210	0.178	0.242
T x in kind	**-0.027**	**-0.025**	**-0.029**
RStransfers (+) (I)	**0.023**	**0.016**	**0.031**
RSinkind (+) (II)	**0.050**	**0.048**	**0.053**
(I) / (I)+(II)	**31%**	**25%**	**37%**
RS (+)	**0.073**	**0.063**	**0.084**

Source: own elaboration. **Note:** RStransfer, RSinkind and RS are positive definite.

Several observations emerge from the Figure and Table. First, in-kind expenditure is the most redistributive tool, followed by cash expenditures (conformed by social security and cash transfers to households). The effect from the expenditure side is partially compensated by taxes that are collected after households earn their income (VAT, other sale taxes, trade taxes, etc.), while taxes collected before households earn their income (social security contributions, income taxes, etc.) are almost neutral. Second, evidence shows an increasing redistributive trend in ex-

penditures and a decreasing trend in taxes. From Table 3, the redistributive effect of in kind expenditure (from 0.073 in 1995-2001 to 0.082 in 2003-2010) comes from expenditure size (from 0.184 to 0.208) rather than progressivity (from 0.399 to 0.396); but the redistributive effect of cash expenditure (from 0.019 to 0.034) comes from both size (0.090 to 0.101) and progressivity (0.211 to 0.337).[73] In the case of taxes, there is a compensation of (decreasing) regression for (increasing) size.

Third, the mix of instruments to redistribute income changed within the period of analysis: the ratio RStranfers / (RStransfers + RSinkind) averaged 31 percent in 1995-2010, 25 percent in 1995-2001 and increased to 37 percent in 2003-2010. From the description in Section 4, the (monetary) mix of cash and in-kind expenditures and taxes did not change significantly, but the composition of cash expenditures did (from social security and others to spending in promotion, assistance and work). It is worth to notice that during the period 2003-2010 a significant amount of payments were transfers conditioned on the recipient rendering some work services (*Plan Jefes y Jefas de Hogar*, *Seguro de Capacitación y Empleo*, *Familias por la Inclusión Social*; see Alejo et al., 2013). This way, the distributive intensity of instruments tilted towards cash transfers and against in-kind expenditures. The mix effect has two important consequences. On the one hand, it creates dependence by cash-recipients, not only a financial dependence but also a political dependence, favoring clientelism.[74] On the other hand, it is far from the most efficient tool to correct income distribution, because X pesos in transfers are spent in current consumption, while X pesos spent as in-kind public good (schools, transport infrastructure, hospitals, urban infrastructure, justice, water and sanitation,

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73   Alejo, Bérgolo and Carbajal (2013) decompose income distribution by the contribution of different sources of income (private and public, and social security, government transfers and others within public sources) in Argentina, Chile and Brazil during the decade of 2000s. The progressive results for Argentina coincide with those in this paper for cash expenditures (i.e., RStransfers). While they concentrate on the different sources of income, the main difference with this paper is that we include revenues and expenditures –both cash and in kind–, consider national and provincial governments, and decompose effect among groups of provinces (and among provinces, forthcoming); but we pool some sources of income, which are analyzed separately in their paper.

74   Recent literature has identified overspending in terms of employment, assigning a responsibility to clientelism (Gimpelson and Treisman, 2002; Calvo and Murillo, 2004). Along this line, policymakers allocate resources to seek for the support of a group of citizens, channeling them through employment offers in the public sector. Robinson and Verdier (2013) link such expenditures to the chances of patron policymakers in electoral competition. Oliveros (2013) argues that employees engage in political activities that support politicians (patrons) because their fates are tied to the political fate of their patrons. The literature on clientelism is rather large to summarize it here (see a discussion and related literature in these papers).

etc.) benefits large groups of recipients, during a long-time period.[75] Of course, there may be exceptions (such as the years following the 2002 crisis) in which a temporary tool of monetary transfers may be justified.

5.3. Disentangling national and provincial contribution to the Reynolds-Smolensky.

Given that provinces account for almost 50 percent of total expenditure, while the national government retains 76 percent of tax collection, it is worth to identify the relative contributions of their respective fiscal policies. Table 4 and Figure 4 summarize the contribution of national and provincial budgets to the RS coefficient. The average RS of 0.073 (-0.063 in 1995-2001 and -0.084 in 2003-2010) is the result of expenditure progressivity and size (0.104 in average, 0.092 in 1995-2001 and 0.116 in 2003-2010) and taxation regressivity and size (approximately -0.03 in average and in the corresponding sub-periods). Provincial expenditure accounts for 66 percent of the positive impact of expenditure on income distribution (68 percent in 1995-2001 and 65 percent in 2003-2010). On the other hand, national revenues explain the negative impact of taxation, while provincial taxes contribute very little. Also, provincial expenditures are more progressive than national expenditures: the Kakwani coefficient averaged 0.481 in the first case and 0.237 in the second case (because education and health represent a high share of provincial expenditure while cash payments represent a lower share of national expenditure).[76]

5.4. Reynolds-Smolensky decomposition between expenditures and taxes.

A final aggregate comparison concerns the expenditure functions and sources of taxes. Table 5 and Figure 5 show the RS decomposition between expenditures on social services, economic services, and administration, police and justice (administration, in short), and taxes collected from production, consumption and transactions; income and assets; and others. As expected, social expenditure (Kg averaging 0.396, and increasing from 0.360 in 1995-2001 to 0.430 in 2003-2010) is most important than economic services (Kg averaging 0.097, from 0.108 in

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75. A deep analysis of the benefits of cash vs. in-kind expenditures is necessary. In the education sector, on the one hand, in-kind expenditures might result of redundant employment but, on the other hand, deficit in infrastructure affects performance of children. In Argentina and other Latin American countries, the deficit is higher in schools located in poorer neighborhoods (Duarte et al., 2011).

76. The fact that provincial budgets contribute to redistribution more than the national budget was already noticed by Cont and Porto (2014) in an analysis concentrated on year 2004.

Figure 4. Contribution of national and provincial expenditure and national and provincial taxes to Reynolds-Smolensky.
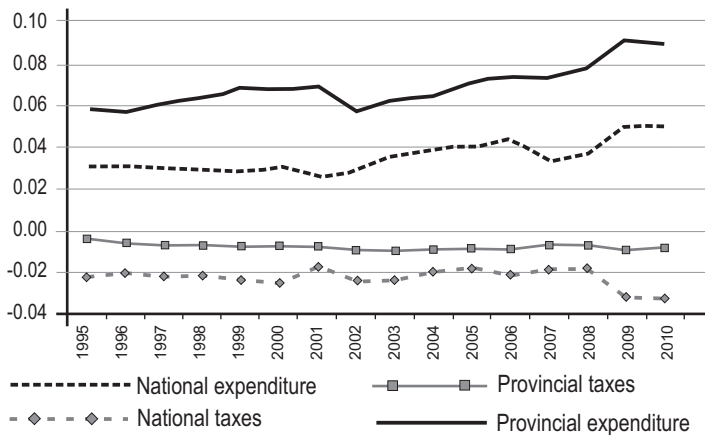
Observation about this Figure 4: Expenditure (Taxes) measures the joint effect of size and progressivity g*Kg(t*Kt).

Table 4. Reynolds-Smolensky: National and Provincial budgets.

Gini ea vs ep	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
G	0.089	0.087	0.090	0.092	0.095	0.097	0.094	0.085	0.098	0.103	0.111	0.116	0.106	0.113	0.140	0.138
gN	0.031	0.030	0.030	0.029	0.028	0.030	0.026	0.028	0.036	0.039	0.040	0.043	0.033	0.036	0.049	0.049
KgN	0.203	0.205	0.229	0.218	0.201	0.217	0.200	0.233	0.272	0.294	0.290	0.306	0.222	0.220	0.255	0.232
gN/(1-t+g)	0.150	0.148	0.132	0.134	0.139	0.136	0.128	0.120	0.134	0.132	0.137	0.141	0.149	0.162	0.192	0.212
gP	0.058	0.057	0.060	0.063	0.067	0.067	0.069	0.057	0.062	0.064	0.071	0.073	0.073	0.078	0.091	0.089
KgP	0.436	0.443	0.463	0.472	0.480	0.482	0.478	0.473	0.497	0.486	0.498	0.496	0.478	0.485	0.518	0.506
gP/(1-t+g)	0.133	0.128	0.130	0.134	0.140	0.140	0.143	0.121	0.125	0.132	0.142	0.148	0.153	0.160	0.175	0.176
T	-0.027	-0.027	-0.029	-0.029	-0.031	-0.033	-0.026	-0.034	-0.034	-0.029	-0.027	-0.031	-0.026	-0.025	-0.042	-0.041
t_N	-0.022	-0.020	-0.022	-0.022	-0.024	-0.025	-0.018	-0.024	-0.024	-0.020	-0.018	-0.021	-0.019	-0.018	-0.032	-0.033
KtN	-0.118	-0.113	-0.124	-0.122	-0.141	-0.145	-0.127	-0.142	-0.117	-0.086	-0.084	-0.093	-0.078	-0.072	-0.121	-0.109
t_N/(1-t+g)	0.190	0.179	0.177	0.177	0.168	0.175	0.140	0.170	0.204	0.230	0.218	0.229	0.238	0.248	0.264	0.303
tP	-0.005	-0.006	-0.007	-0.007	-0.008	-0.008	-0.008	-0.009	-0.010	-0.009	-0.009	-0.009	-0.007	-0.007	-0.010	-0.008
KtP	-0.073	-0.099	-0.104	-0.107	-0.112	-0.117	-0.120	-0.148	-0.142	-0.131	-0.129	-0.128	-0.096	-0.096	-0.117	-0.099
tP/(1-t+g)	0.065	0.065	0.069	0.066	0.067	0.068	0.065	0.064	0.071	0.071	0.071	0.074	0.072	0.078	0.083	0.084
RS (+)	**0.062**	**0.060**	**0.061**	**0.064**	**0.064**	**0.064**	**0.069**	**0.052**	**0.065**	**0.074**	**0.083**	**0.086**	**0.081**	**0.088**	**0.098**	**0.097**

Source: own elaborations.

Note: RS is positive definite.

1995-2001 to 0.085 in 2003-2010). This way, the redistributive effect of social services inherits those of education and health (which represent about 41 percent of consolidated budget in 2003-2010), social security (41 percent) and direct cash transfers to households (13 percent, having increased 4 points between sub-periods, see Table 1). Notice also that the size of economic expenditures almost doubled from 2.1 percent of GDP in 1995-2001 to 4 percent of GDP in 2003-2010, pushed by government subsidies in energy and transport (in these sectors consumption is more evenly distributed across population than in other sectors). On the other hand, taxes based on consumption and production increased from 11.4 percent of GDP in 1995-2001 to 16.7 percent of GDP in 2003-2010, mostly explained by increases in VAT and the introduction of export taxes; while taxes based on income and assets increased from 9 percent of GDP in 1995-2001 to 11.8 percent of GDP in 2003-2010. Again, sizes compensated the lower component of regressive taxation.

Table 5. Reynolds-Smolensky of expenditures (social services, economic services and administration) and taxes (production-consumption-transactions, income-assets, others).

Ex ante vs. Ex post	1995-2010	1995-2001	2003-2010
Kg_(SS)	0.396	0.360	0.430
g_(SS)	0.192	0.184	0.201
Kg_(ES)	0.097	0.108	0.085
g_(ES)	0.030	0.021	0.040
Kg_(A)	0.366	0.345	0.384
g_(A)	0.067	0.068	0.068
Kt_(PCT)	-0.109	-0.120	-0.098
t_(PCT)	0.141	0.114	0.167
Kt_(IA)	-0.030	-0.031	-0.027
t_(IA)	0.104	0.090	0.118
Kt_(R)	-0.377	-0.362	-0.382
t_(R)	0.033	0.034	0.032
RSp	**0.073**	**0.063**	**0.084**

Figure 5. Reynolds- Smolensky of expenditures (social services, economic services and administration) and taxes (production-consumption-transactions, income-assets, others).
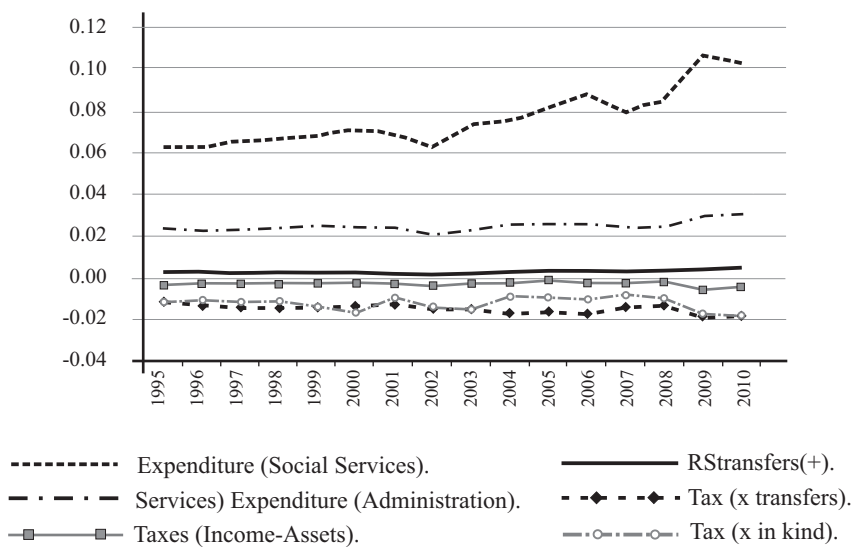
Observation about Figure 5: Expenditure (Taxes) measures the joint effect of size and progressivity g*Kg (t*Kt).

How redistributive are the results for Argentina compared with other countries? Hani et al. (2014) compare the effect of fiscal policy on income distribution in Latin American countries (year 2011). Inequality is high in Latin America: Gini coefficients range from 0.573 in Brasil to 0.400 in El Salvador and Venezuela. Fiscal policy redistributes income progressively in all countries. The average effect in the 17 countries of Latin America is a reduction of the Gini coefficient in 9 points. Given the size of fiscal policy considered by the authors (it includes social expenditure and income taxes, which approximates to our construction of social expenditure and income-assets taxes), the redistribution effect is similar to the 8.5 points (out of 9.7 points of consolidated effect) in Argentina in 2010. Similar results can be found in Lustig et al. (2013): the average Gini decreased in 16 out of 17 countries, from an average of 0.548 during selected years around 2000 to an average of 0.488 during selected years around 2010. The authors ascribe such changes to the

functioning of labor markets and to government transfers. Lustig et al. (2014) report a positive impact of direct taxes and social spending on inequality and poverty reduction in six Latin American countries (Argentina, Bolivia, Brazil, Mexico, Perú and Uruguay). They refer to the case of Argentina as one in which the government embarked on a redistributive process that generates unfair losses and may not be fiscally sustainable. In spite of all these results, fiscal policy seems to have little effect in reducing income inequality, compared to OECD and EU countries, in which changes are 23 points and 18 points, respectively (Hani et al., 2014; see also Goñi et al., 2008). The main differences are explained by a large public sector size, which conditions the size of redistributive policies, large social security coverage, and high share of (progressive) income taxes in OECD and EU countries, relative to Latin American countries (and, specifically, Argentina).

6. Conclusions.

This paper analyzes the effect of consolidated (national-provincial) fiscal policy on personal income distribution in Argentina during 1995-2010, following benefit and incidence principles, and avoiding double accounting. We build a novel database, which allows us to construct ex ante, interim and ex post measures of income inequality. The *Gini interim*, constructed from household surveys, increased from 0.457 to 0.508 in 2002 and decreased to 0.451 in 2010. The *ex ante* and *ex post* measures of inequality followed a qualitatively similar trend. Such trends have a parallel with two socioeconomic regimes nested in the sample (Convertibility between 1995 and 2001 and post -Convertibility since 2002).

The effect of fiscal policy is an average reduction in the Gini coefficient of 7 points during the period of analysis (6 points during 1995-2001; 8 points during 2003-2010). We approach this result by reviewing different channels, which is possible from a decomposition between (i) cash expenditure *vs.* in-kind expenditure, and their corresponding taxes, (ii) national and provincial budgets (expenditures and taxes), and (iii) spending in social services, economics services and administration *vs.* taxes on production, consumption and transactions, on income and others.

The first decomposition is relevant to unveil dynamics in fiscal policy. The mix of instruments to redistribute income changed with time, tilting towards cash transfers and against in-kind expenditures. The "mix effect" has two consequences. On the one hand, it creates dependence by cash-recipients, not only a financial dependence but also a political dependence, favoring clientelism. On the other hand, it is far from the most efficient tool to correct income distribution, although we favor a deeper analysis of the efficiency-equity performance of such tools.

The second decomposition is useful assess the effect of expenditures and taxes and to identify the role of provinces in redistribution. The average RS coefficient of

0.073 (-0.063 in 1995-2001 and -0.084 in 2003-2010) is the result of expenditure progressivity and size (0.104 in average, 0.092 in 1995-2001 and 0.116 in 2003-2010) and taxation regressivity and size (approximately -0.03 in average and in the corresponding sub-periods). We find that provincial expenditure accounts for 66 percent of the positive impact of expenditure on income distribution (showing a little reduction in 2003-2010). National revenues explain the negative impact of taxation, while provincial taxes contribute very little. A direct conclusion from this result is the need to strengthen relationships between national and provincial governments, and to improve efficiency in provision of services.

The third decomposition is important because, on the one hand, it unveils the evolution of typical social spending (encompassing education, health, social security and cash transfers to household) *vs.* subsidies on consumption in energy and transport, which took place during the last decade, and, on the other hand, allows us to compare with international findings. As expected, social expenditure is the most important redistribution tool. However, we notice the increasing role of economic services (which are less progressive than social services) in the post-Convertibility sub period, pushed by government subsidies in energy and transport. Although a cross-country comparative analysis is unfeasible at this level of detail, we compare our results with those available in the literature: a partial effect (approximated through social expenditure and income taxes) is similar to results found for Latin American countries, which altogether underestimate the full effect of fiscal policy. Also, the effect on redistribution is less than that in OECD and EU countries, where the main characteristics of fiscal policy is higher size of public sector and higher share of progressive income taxes. Argentina went through this path recently (as the size of the consolidated public sector increased from 40 to 45 percent of GDP, and income taxes increased from 6 to 8.5 percent of GDP, between 2010 and 2014). Such changes faced some social resistance, but their progressive effects are yet to be measured, and their stability or reversion will be under review during the coming Administration (December, 2015).

We alert of the importance of understanding the limitations of works that measure (partial or full) incidence of fiscal policy, which go beyond assumptions made to allocate expenditures and taxes among households. Typically, papers measure the distribution of budget but leave aside the distribution of results. For example, some papers find pro-poor expenditures but pro-rich results (see Skinner and Zhou, 2006, and comment by Le Grand, 2006). Dixon et al. (2007) find significant results from the substitution of low-quality public goods or services for high-quality private goods, differences in information of different groups and their control on the way services are provided (not only through "exit" as in the previous case, but also through "voice"), or the cost of complementary services (transport costs or indirect cost of forgone labor to receive health services, etc.). Another ex-

ample, concerning education in Argentina, is that expenditure in elementary and high-school education is typically found as pro-poor; however, performance results by public schools is significantly lower that performance by private schools. This is reflected, for example, in trend changes in school enrolment (83 out of 100 new students in elementary and high-school enrolled in private schools during 2003-2010; this ratio was 22 in 1996-2003), success rates (70 percent of enrolled students in private schools finish high-school; this rate is 27 in public schools), and geographic performance (40 percent of enrolled in CABA graduated from high school; 14 in Santiago del Estero), as reported by CEA (2015). Similar results ("helping the good better, but leaving the poor behind") were found by Galiani et al. (2008) in their study on the impact of decentralization of high schools in Argentina. Llach et al. (2006) and Duarte et al. (2011) complement these results by finding that children form lower economic and social level attend lower-quality elementary and high schools (measured by the endowment of physical, human and social capital).

Several aspects widely discussed in theoretical papers, but less covered in empirical papers, such as externalities of some categories of expenditures, leakages in expenditures, and tax burden, were taken into account. Simulations of these aspects (not included in the paper) seem to suggest that the first two effects weaken the positive impact of provincial fiscal budgets (if the leakage or externality is appropriated by medium to high income households). Tax burden creates more size effects than distributive effects (in particular, if the tax system is mildly regressive).

During the time period analyzed in this paper, fiscal policy compensated income inequality arising from market conditions (for example, the Gini coefficient decreased 6 points in 1995-2001 and 8 points in 2003-2010), but the long-term effects seem to be fade out. The ex-ante Gini in 2010 was similar to that in 1996-1997. A relevant question to undertake in the future regards the long-term sustainability of compensatory fiscal policy, particularly in a country with a public sector that grew from 28 percent in 1995 to about 40 percent in 2010, biasing towards centralized government, and taking into account that the expenditures with more redistributive impact are provided by provincial governments. The benefits of this process may accrue in the long term.

The case of Argentina may provide useful lessons for other federal countries, in particular, considering all the expenditures and taxes and the responsibility of different levels of governments and their effect on income distribution.

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Geografía de la Desigualdad en la Distribución Personal del Ingreso y en el Impacto Distributivo de la Política Fiscal. Argentina 1995-2010[*]

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Resumen.

El objetivo de este trabajo es estudiar la geografía de la distribución personal del ingreso y del impacto distributivo de la política fiscal en la Argentina. Las unidades de observación son los quintiles de ingreso per cápita dentro de cada una de las 24 jurisdicciones subnacionales, y el período de análisis es 1995-2010. Las mediciones se realizan para el ingreso de mercado y para el ingreso post-política fiscal. Se presentan hechos estilizados sobre la geografía de la distribución personal del ingreso y del impacto de la política fiscal, y se analiza la relación entre la desigualdad y varios determinantes económicos, sociales y fiscales.

Palabras clave: desigualdad, política fiscal, gobiernos subnacionales.

Abstract.

This paper studies the geographic characteristics of personal income distribution and the distributive impact of fiscal policy. Observation units are the quintiles of per capita income in the 24 subnacional jurisdictions (provinces) in Argentina during the period 1995-2010. We obtain estimations for market income (ex ante) and income after fiscal policy (ex post). We present stylized facts and study the relationships between inequality and economic, social and fiscal determinants.

Key words: inequality, fiscal policy, subnational governments.
JEL Code: H7, I3.

1. Introducción.

El objetivo de este trabajo es estudiar la geografía de la distribución personal del ingreso y del impacto distributivo de la política fiscal en la Argentina. Las unidades de observación son las jurisdicciones subnacionales (23 provincias y la Ciudad Autónoma de Buenos Aires), a su vez, subdivididas en 5 grupos de ingreso (quintiles), y el período de análisis es 1995-2010. Este trabajo forma parte de una agenda de investicación que analiza el efecto de la política fiscal sobre la distribución del ingreso, siguiendo los ingresos ex ante y ex post de las personas. En trabajos anteriores se presentaron resultados para la Argentina. Sin embargo, la problemática del impacto de la política fiscal sobre la distribución del ingreso es lo suficientemente importante a nivel provincial como para que su análisis ocupe un lugar propio.

En este contexto, el trabajo se organiza de la siguiente forma. La Sección II se ocupa de las cuestiones metodológicas. En la Sección III se presentan hechos estilizados sobre la geografía de la distribución personal del ingreso y del impacto de la política fiscal. La Sección IV busca estudiar relaciones entre la desigualdad y varios determinantes económicos y fiscales, utilizando modelos econométricos simples. La Sección V presenta conclusiones.

Los principales resultados de la primera parte de esta investigación (hechos estilizados) son que existen diferencias importantes en la desigualdad del ingreso de mercado entre provincias; la política fiscal tiene un fuerte impacto sobre la desigualdad; el Gini promedio disminuye 0,106 puntos para el promedio 1995-2010; el impacto es muy diferente entre provincias y provoca un importante reordenamiento en el ranking de desigualdad ex post, comparado con el que resulta de comparar la desigualdad de mercado. El mix de instrumentos fiscales redistributivos cambió a lo largo del tiempo en favor de las transferencias en dinero vs las transferencias en especies: para 1995-2010 el 83% de la disminución del Gini se debe a los gobiernos provinciales, pasando del 87% en 1995-2001 al 80% en 2003-2010, siendo adjudicable a la centralización fiscal en el último período. Por su parte, el gasto provincial es 66% más progresivo que el nacional, mientras que regresividad de los impuestos se debe fundamentalmente a los tributos del gobierno nacional.

Una vez que se caracterizaron estos hechos estilizados, se realizaron estimaciones de la relación entre variables de ingreso, apertura económica, nivel educativo, gastos e impuestos y progresividad de la ejecución presupuestaria, con la desigualdad ex ante y ex post. En lo que respecta a las interacciones con la desigualdad ex ante, se observa una relación negativa entre el PBG per cápita real y la desigualdad, capturando el efecto de Kuznets que vincula un aumento en el ingreso con la reducción en la desigualdad. La relación con las variables de globalización y de educación presentan una relación más general de U invertida, en línea con las propues-

tas teóricas y con parte de la evidencia empírica que la soporta, según la cual, partiendo de niveles de apertura o nivel educativo bajos, la relación con la desigualdad es creciente hasta un nivel a partir del que la relación se revierte.

La ejecución presupuestaria modifica la relación entre el nivel de ingreso y desigualdad ex post, principalmente en las unidades económicas de mayor ingreso (cuyo ingreso correlaciona positivamente con la desigualdad). También modifica la relación entre el nivel educativo y la desigualdad, que se torna negativa (en línea con los resultados de la literatura empírica), pero no genera efectos significativos en la relación entre apertura y desigualdad. Por último, se identifica una correlación positiva entre el nivel democrático provincial y la desigualdad ex post en la distribución del ingreso (inexistente al comparar con la desigualdad ex ante), que es contraria a lo esperado y a los resultados obtenidos por otros autores.

Una vez obtenidas las relaciones entre la desigualdad ex post y los indicadores de ingreso, apertura y educación, se analizó el efecto de la ejecución presupuestaria sobre la desigualdad ex post, descomponiéndolo en un efecto "nivel" (déficit y sus componentes) y un efecto "redistributivo" (Reynolds-Smolensky). El efecto redistributivo es el esperado, y captura una parte de la desigualdad ex post. Dentro de las distintas variables que componen el efecto nivel, se destaca la ejecución del gasto propiamente dicha (y, a su vez, los gastos nacionales y gastos provinciales) pero no tanto los recursos (adquiriendo relevancia los nacionales solamente). Considerando una descomposición del gasto en servicios sociales, económicos y administración, por un lado, y de recursos en producción-consumo-transacciones, ingreso-activos y resto, por otro lado, se identifica un efecto nivel por la vía de la recaudación sobre ingresos y activos y gastos en servicios económicos (llamativamente los gastos sociales tienen poca significatividad por la vía del efecto nivel). Por último, considerando una descomposición del gasto en transferencias de dinero o en especie, y de recursos según sean directos o indirectos, se identifica un efecto nivel por la vía de gastos en especie y recursos cobrados directamente a los individuos.

Los estudios empíricos sobre el tema son escasos debido principalmente a la falta de información. Un avance importante en el campo de los datos es el trabajo de Solt (2016) que reúne información para un largo período y para más de 170 países sobre la desigualdad en la distribución del ingreso y el impacto de la política fiscal. También provee información a nivel regional dentro de distintos países. La información permite comparar el ingreso de mercado (pre-impuestos, pre-gasto público) con el ingreso que denomina disponible (post-transferencias, post impuestos para financiarlas). Esta cobertura es parcial comparada con el trabajo presente que considera toda la actividad del sector público (transferencias en dinero y gastos en especies y sus correspondientes financiamientos). En Cepal-IEF (2014) se trabaja con toda la actividad del sector público –como en el trabajo presente– pero a nivel

de países, sin avanzar en la consideración regional-personal. Por su parte, los estudios de Balanzas Fiscales en España (entre otros, Uriel y Barberán, 2007) tienen por objetivo cuantificar, a nivel de las Comunidades Autónomas, el saldo neto que resulta de los gastos e impuestos de la Administración Central. El objetivo es la redistribución territorial sin avanzar en el impacto sobre la distribución personal en cada Comunidad.

Los estudios de la geografía de la desigualdad a nivel de regiones ocupa recienemente un lugar importante en los estudios de la ciencia política. Estos trabajos (entre otros, Beramendi 2012) se ocupan de la relación entre las distribuciones regional y personal, la geografía económica, la representación política y la movilidad.

2. Medidas de desigualdad de ingresos e impacto distributivo de la política fiscal. Metodología.

Se presentan tres definiciones alternativas de ingreso personal: a) la que mide la distribución del ingreso resultante del mercado, sin computar la actividad del gobierno (ex–ante); b) la que mide la distribución monetaria del ingreso que resulta de sumar a la anterior las transferencias monetarias, tanto positivas como negativas, que realiza el gobierno (interim); c) la que agrega al anterior (b) el impacto distributivo de la provisión de bienes en especie y el cobro de impuestos indirectos (ex–post).

Para calcular el impacto distributivo de la política fiscal: (i) se considera el presupuesto consolidado Nación-Provincias, incluyendo todos los gastos e impuestos del gobierno nacional y de los gobiernos provinciales, sin duplicaciones; (ii) se asignan los gastos e impuestos a cada provincia, y a cada grupo de personas dentro de cada provincia, siguiendo los criterios de beneficio del gasto e incidencia de los impuestos; (iii) se calcula el "residuo fiscal neto", como diferencia entre el beneficio del gasto y la incidencia de los impuestos, a nivel de provincias y de grupos de personas dentro de cada provincia.[77]

Se calculan los coeficientes de Gini de desigualdad en la distribución del ingreso y los índices de Reynolds-Smolensky (RS) para medir los cambios del Gini al pasar del ingreso ex ante al interim y al ex post. Se cuantifica el impacto de cada nivel de gobierno y del consolidado. Los índices de Reynolds-Smolensky se desagregan en los efectos tamaño y progresividad. Las definiciones son las siguientes:

El coeficiente de Gini mide la desigualdad en la distribución del ingreso y una fórmula similar se utiliza para las curvas de concentración de ingresos y gastos. Pa-

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77. La metodología y cuantificación para cada uno de los años están detalladas en Cont y Porto (2016a).

ra cada unidad (país, grupo de provincias o una provincia) el coeficiente es calculado en la forma siguiente,

$$G = 1 + \frac{1}{I} - 2\sum_{i=1}^{I}\frac{(I+1-i)\,y_i}{I^2 y^P} \tag{1}$$

donde las familias son ordenadas del ingreso más bajo al más alto. El número de grupos de ingresos es $I=5$, debido a la división de la población en quintiles: y son los ingresos ex ante, interim o ex post; finalmente, y^P es el ingreso promedio de la unidad analizada.

Para cuantificar el impacto de la política fiscal sobre la distribución del ingreso se utilizan diversas descomposiciones del indicador propuesto por Reynolds y Smolensky (1977).

Suponiendo una descomposición genérica del gasto en $l=1,...,L$ componentes y una descomposición genérica de impuestos en $j=1,...,J$ componentes, el coeficiente Reynolds-Smolensky es:

$$RS_p = -\frac{\sum_{j=1}^{J} t_j\,Kt_j + \sum_{l=1}^{L} g_l\,Kg_l}{1 - \sum_{j=1}^{J} t_j + \sum_{l=1}^{L} g_l} \tag{2}$$

donde t_i es el esfuerzo tributario del impuesto j (en términos del PBG); g_l es el tamaño del gasto l (relativo al PBG); Kt_j es el índice de Kakwani de progresividad del impuesto j, igual a la diferencia entre las curvas de concentración del impuesto y la ecuación (1); y Kg_l es el índice de Kakwani de progresividad del gasto l, igual a la diferencia entre (1) y la curva de concentración del gasto. Se permite la existencia de superávit o déficit, o sea, que $\Sigma_j t_j \neq \Sigma_l g_l$.

Las descomposiciones presupuestarias analizadas en este trabajo son tres. En primer lugar, se analiza el impacto de los gastos denominados en "efectivo" y en "especie" con las respectivas fuentes de financiamiento. En tal caso, $j=C,E$ y $l=C,E$ (C: cash; E: especie). En segundo lugar, se realiza un análisis del impacto de los presupuestos nacional-provincial. En tal caso, $j=N,P$ y $l=N,P$ (N: nacional; P: provincial). Por último, se considera el aporte distributivo de gastos en servicios sociales, económicos y administrativos, en conjunto con el de los impuestos sobre las transacciones, los ingresos y otros. En tal caso, $l=SS,SE,A$ y $j=PCT,IA,O$ (donde PCT es producción, consumo y transacciones; IA corresponde a ingresos y activos; y O corresponde a otros recursos no incluidos en los otros dos grupos).

3. Contabilidad de la geografía de la distribución personal del ingreso y del impacto de la política fiscal. Hechos estilizados.

3.1. Coeficientes de Gini y de Reynolds-Somolensy por Provincias.

En las Tablas 1 a 3 se incluyen los cálculos de los tres coeficientes de Gini (para las tres medidas de ingreso) y los índices de Reynolds-Smolensky que los unen, pa-

ra la primera descomposición: efectivo – en especie. Se incluyen también la relación entre el Gini ex post y el ex ante (denominada "Gini ep/Gini ea") y la relación porcentual entre el RS en efectivo y el RS total. Los cálculos corresponden a los promedios 1995-2010, 1995-2001 y 2003-2010. La división en los dos períodos se justifica por coincidir con diferentes regímenes macroeconómicos (convertibilidad entre 1995 y 2001 y post convertibilidad desde 2002). Desde la perspectiva macroeconómica, el período 1991-2001 estuvo caracterizado por una economía con una tasa de cambio fija con el dólar estadounidense, una política monetaria estricta, y una política fiscal laxa que culminó en una situación de déficit fiscal significativo en la segunda parte de la década y una crisis económico-social-fiscal en 2001-2002. Después de un año de fuerte crisis en 2002, los años restantes hasta 2010 se caracterizaron por muy buenas condiciones externas, un tipo de cambio libre, una política monetaria flexible y un superávit fiscal que se debilitó en los últimos años (Figura 1).

Figura 1. Evolución del balance fiscal consolidado –nacional y provincial– (como porcentaje del PBG) y PBG per cápita (en miles de pesos constantes de 2010)
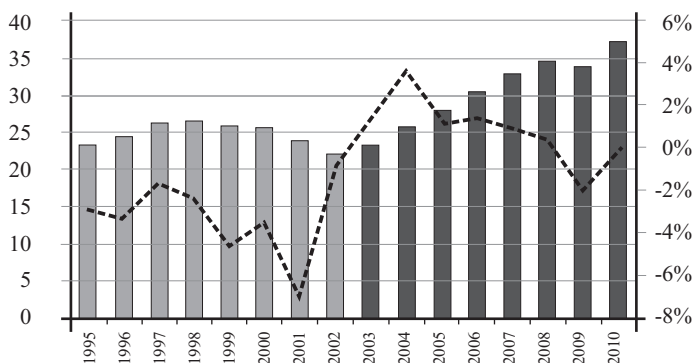
PIB per capita ('000 Pesos del año 2010) - eje izquierdo.
- - - - Resultado fiscal consolidado (+ superávit / - deficit) en % del PIB - eje izquierdo.

Considerando el promedio 1995-2010 (Tabla 1 en el Anexo) se aprecian importantes diferencias interprovinciales entre las variables. La desigualdad del ingreso de mercado muestra gran variabilidad siendo la relación entre los valores extremos (máximo/mínimo) igual a 1,26: en Chaco el coeficiente de Gini es igual a 0,513 y

en Santa Cruz 0,406. La diferencia entre los valores extremos, que corresponden a las mismas provincias, crece de 1,25 en 1995-2001 a 1,28 en 2003-2010.

El coeficiente de Gini del ingreso de mercado, calculado como promedio simple de los Gini provinciales,[78] registra valores de 0,454 en 1995-2001 y 0,464 en 2003-2010, reflejando un leve aumento de 2,2% en la desigualdad de la distribución del ingreso de mercado (ex ante). Este resultado es intrigante ya que se esperaría que, en un contexto macroeconómico favorable, junto a un aumento del gasto público, se favoreciera el funcionamiento de los mercados por la creación de distintos bienes públicos y mejorara así la distribución del ingreso. En esta línea, suele argumentarse que el mayor gasto público, especialmente el denominado "gasto social" –fundamentalmente en salud y educación–, mejora el capital humano, lo cual constituye un insumo de las funciones de producción del sector privado. Sin embargo, ello no se verifica claramente durante el período analizado para nuestro país.

La comparación de los coeficientes de Gini ex ante y ex post revela un fuerte impacto de la política fiscal en cuanto a disminuir la desigualdad para todas las provincias, con diferencias que van de 56 a 147 puntos porcentuales (promediando 106 puntos, según se observa en la Tabla 1del Anexo). Esta dispersión crece entre los sub-períodos 1995-2001 (diferencia de 83 puntos entre el mínimo y máximo) y 2003-2010 (diferencia de 132 puntos entre el mínimo y máximo).

3.2. Coeficientes de Gini, por provincias, relativos al promedio del conjunto de provincias.

Las Figuras 2 a 4 ubican a las provincias comparando sus índices de Gini ex ante y ex post con los promedios para el conjunto. Las provincias en los cuadrantes suroeste y noreste no modifican su relación de mayor a menor desigualdad con el promedio: aquéllas con desigualdad menor (mayor) que el promedio antes de la política fiscal, se mantienen en la misma situación. En los cuadrantes noroeste y sureste se incluyen las provincias para las que la desigualdad ex post, relativa al promedio, es mayor (y menor, respectivamente) que la ex ante. Existe cierta regularidad entre las provincias que empeoran su situación. El Gini ex post aumenta en la ciudad de Buenos Aires, Córdoba, Mendoza, Santa Fe tanto para el período completo como para los dos sub-períodos. En San Luis, el Gini ex post aumenta en el período completo, pero principalmente debido a los efectos del sub-período 1995-2001. En Bue-

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78. Como el objetivo no es realizar un análisis a nivel nacional, se reportan los promedios provinciales simples de estos indicadores. Ver Cont y Porto (2016 a y b) para los valores correspondientes a total país.

nos Aires y Chubut, el Gini ex post aumenta en el sub-período 2003-2010, pero el efecto es de baja magnitud. Algo similar sucede para las que mejoran la situación, entre las cuales se destacan Formosa, Jujuy, San Juan y Tucumán para el período completo como para los dos sub-períodos, sumándose Catamarca, La Rioja y Santiago del Estero en el sub-período 2003-2010.

Figura 2. Gini ex ante (eje horizontal) y ex post (eje vertical) por provincias. Promedio 1995-2010
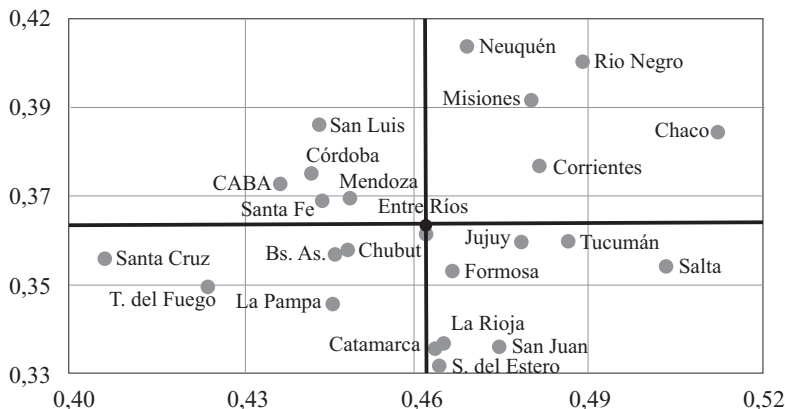
Figura 3. Gini ex ante y ex post por provincias. Promedio 1995-2001
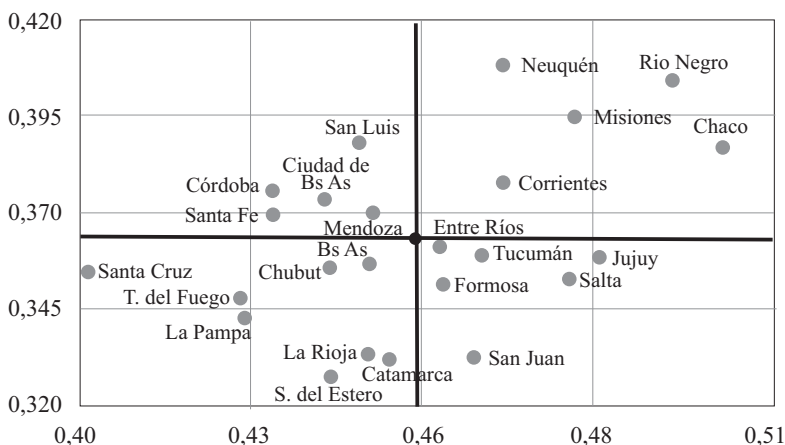
**Figura 4. Gini ex ante y ex post por provincias.
Promedio 2003-2010.**

3.3. Política fiscal y reordenamiento de las Provincias en el ranking de desigualdad.

Las Tablas 4 a 6 muestran que la política fiscal provoca un reordenamiento de las provincias en el ranking de desigualdad. Los casos más notables de pérdida de posiciones (tomando como referencia la Tabla 4 para el período completo) s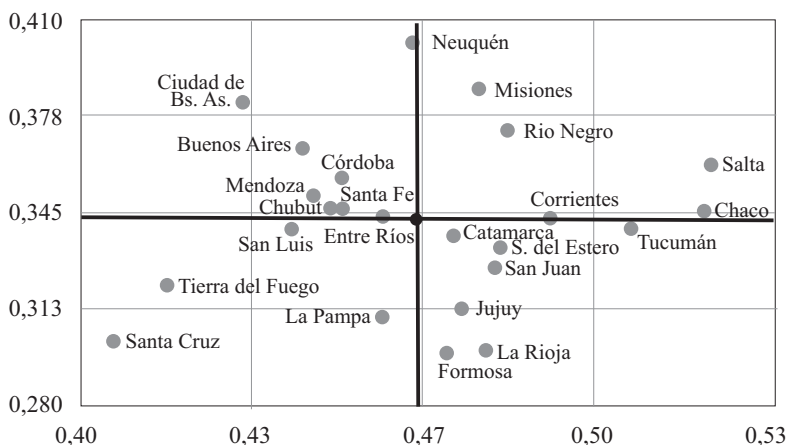on la ciudad de Buenos Aires, del tercer lugar de menor desigualdad al 21, Córdoba del 4 al 19, San Luis del 5 al 17 y Buenos Aires del 9 al 18. En sentido contrario se ubica Formosa que pasa del lugar 15 al 2, La Rioja del 14 al 1, San Juan del 17 al 5, Tucumán del 21 al 10 y Jujuy del 18 al 8. En términos de los coeficientes Gini (Tabla 4, para el período 1005-2010), CABA pasa de 0,436 a 0,380, la provincia de Buenos Aires de 0,448 a 0,367, Córdoba de 0,442 a 0,368, y Santa Fe de 0,444 a 0,361. Por otro lado, La Rioja pasa de 0,465 a 0,318, Jujuy de 0,479 a 0,337 y Chaco de 0,513 a 0,369. Ex ante, las cuatro primeras provincias tienen coeficientes de desigualdad menor que las tres mencionadas en último lugar; ex post, la relación se revierte significativamente (más adelante, las Figuras 11 y 14 muestran en detalle el efecto de estos cambios sobre la relación entre el PBG per cápita y los coeficientes de desigualdad ex-ante y ex-post). En los sub-períodos 1995-2001 y 2003-2010 también se verifican importantes reordenamientos.

Estos reordenamientos se originan en distintas políticas fiscales entre las provincias. A modo de ejemplo, siguiendo con la comparación para el período 1995-

2010, la progresividad del gasto nacional en las provincias (Kg_N) varía entre 0,302 en Misiones y 0,082 en La Rioja; la progresividad del gasto provincial (Kg_P) varía entre 0,683 en la CABA y 0,293 en Santa Cruz. Por su parte, la progresividad de los recursos nacionales (Kt_N) varía entre 0,041 en Santa Cruz y -0,163 en Formosa (siendo en promedio regresivo); mientras que la regresividad de los recursos provinciales (Kt_P) varía entre -0,022 en la CABA y 0,293 en Neuquén. Ver Cuadro 10 para un detalle del efecto de las distintas variables fiscales.

3.4. Descomposición del coeficiente de Reynolds-Smolensky: en efectivo y en especie.

En las Tablas 1 a 3 se presenta una desagregación del coeficiente de Reynolds-Smolensky mostrando la evolución de *RS-C* (*RS* - en efectivo, que mide el cambio del Gini ex ante al Gini interim) y *RS-E* (*RS* - en especie, que mide el cambio del Gini interim al Gini ex post). La diferencia entre los coeficientes Gini de los ingresos ex ante and ex post es igual a la suma de *RS-C* y *RS-E*.

El mix de instrumentos para redistribuir ingresos cambió a lo largo del tiempo: en 1995-2001 el coeficiente RS-C / (RS-C + RS-E) fue 21,4% alcanzando el 35,7% en 2003-2010 (promediando 29,2% en todo el período analizado). La intensidad en el uso de instrumentos cambió hacia las transferencias en dinero y en contra de las transferencias en especies. Este cambio tuvo dos consecuencias: por un lado, generó dependencia de los receptores, no solo financiera sino también política, lo que habría alentado el clientelismo. Por otro lado, no es la forma más eficiente de redistribución ya que X pesos de transferencias en dinero son gastadas en consumo corriente, mientras que los mismos X pesos gastados en transferencias en especies (escuelas, infraestructura de transporte, hospitales, justicia, agua, infraestructura urbana, seguridad, etc.) brindan utilidad a un conjunto de personas por un largo período (corrigiendo por posibles ineficiencias en los gastos en especie). Por supuesto, puede haber excepciones (como los años que siguieron a la crisis de 2002) en los que un instrumento temporario como las transferencias en dinero puede estar justificado; u otras más generales, como gastos en especie que no llegan al beneficiario final.[79] El mix de instrumentos fue muy diferente entre provincias: el máximo fue 46% (Neuquén) y el mínimo 19% (La Rioja) en el período 1995-2010, 33%-3% en 1995-2001 y 53%-24% en 2003-2010. Nótese que los extremos se ampliaron a lo largo de los dos períodos (Figuras 5 a 7).

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79. Existen varios ejemplos respecto de este problema: hospitales sin personal, o que no se inauguran luego de la construcción, o duplicaciones de cuerpo docente en educación, etc. Este tema requiere de un análisis específico, que escapa el objeto de este trabajo.

Figura 5. Instrumentos de redistribución por provincias.
RS-C / (RS-C + RS-E) (%).
Promedio 1995-2010.
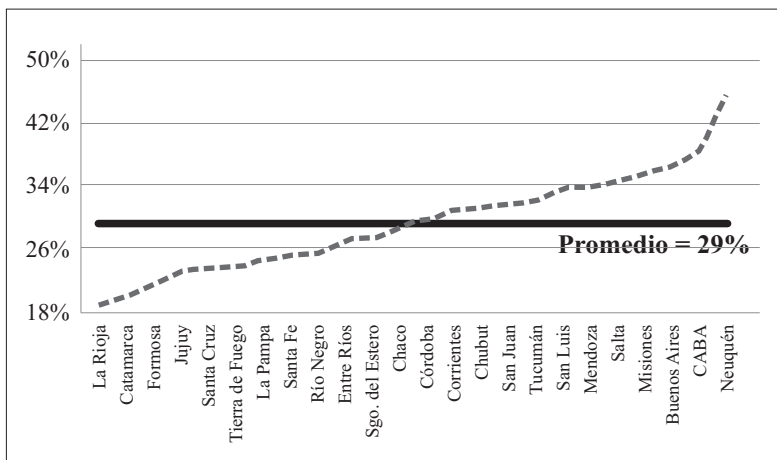
Fuente: datos de Tabla 1.

Figura 6 . Instrumentos de redistribución por provincias.
RS-C / (RS-C + RS-E) (%).
Promedio 1995-2001.
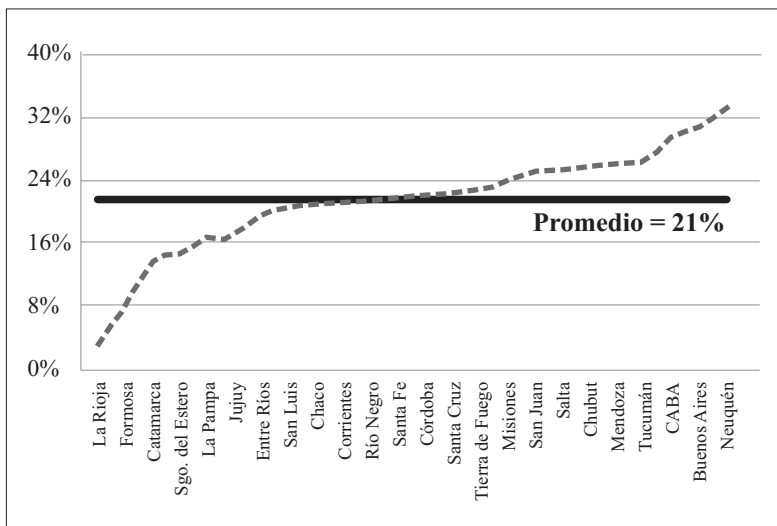
Fuente: datos de Tabla 2.

**Figura 7. Instrumentos de redistribución por provincias.
RS-C / (RS-C + RS-E) (%).
Promedio 2003-2010.**
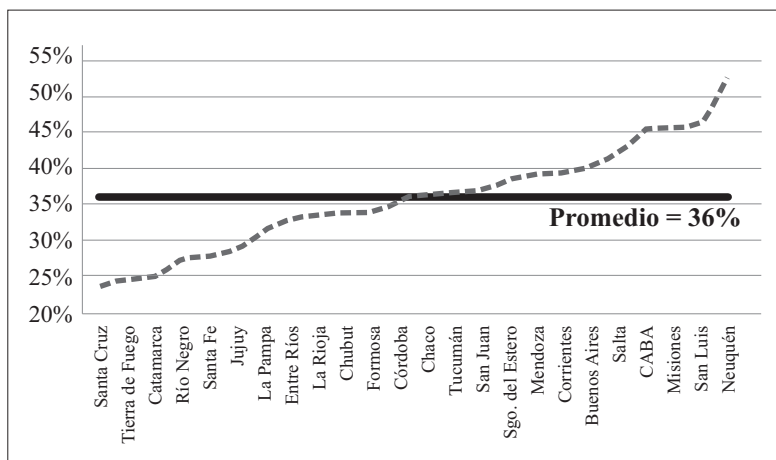
Fuente: datos de Tabla 3.

3.5. Contribución de los dos niveles de gobierno a la disminución de la desigualdad.

La contribución de los dos niveles de gobierno a la diferencia entre los Ginis ex ante y ex post (RS-N corresponde a la contribución del gobierno nacional y RS-P corresponde a la contribución de los respectivos gobiernos provinciales) se presenta en las Tablas 7 a 9 del Anexo.[80]

Para 1995-2010 el 83% de la disminución del Gini se debe a la ejecución de los presupuestos de las provincias (incluyendo los recursos nacionales que financian los gastos provinciales, tanto vía transferencias automáticas como discrecionales). El valor máximo es del 98% (La Rioja) y el mínimo 61% (CABA). La comparación de 1995-2001 con 2003-2010 muestra que la participación provincial disminuyó de un promedio de 87% al 80% resultado que se adjudica al proceso de centralización fiscal en el segundo período (Figuras 8 a 10).

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80. Para el detalle por años ver Cont y Porto (2016 a), Tablas 23 a 41.

**Figura 8. Participación (%) del nivel provincial en la disminución del Gini.
Promedio 1995-2010.**
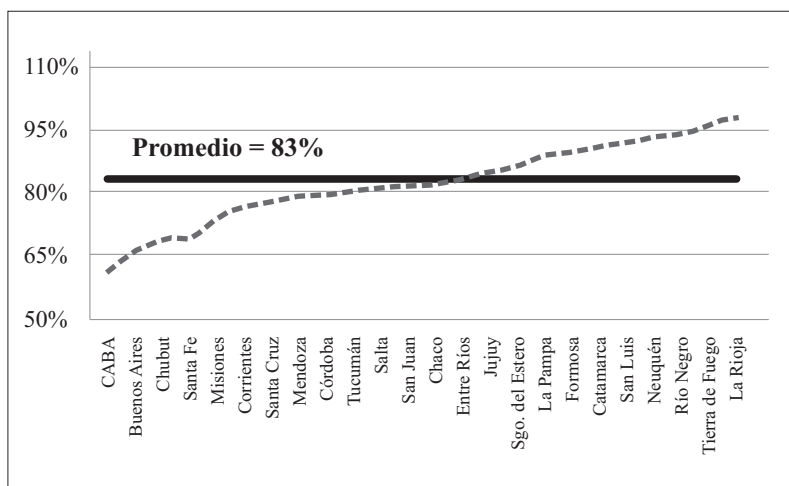
Fuente: datos de Tabla 7.

**Figura 9. Participación (%) del nivel provincial en la disminución del Gini.
Promedio 1995-2001.**
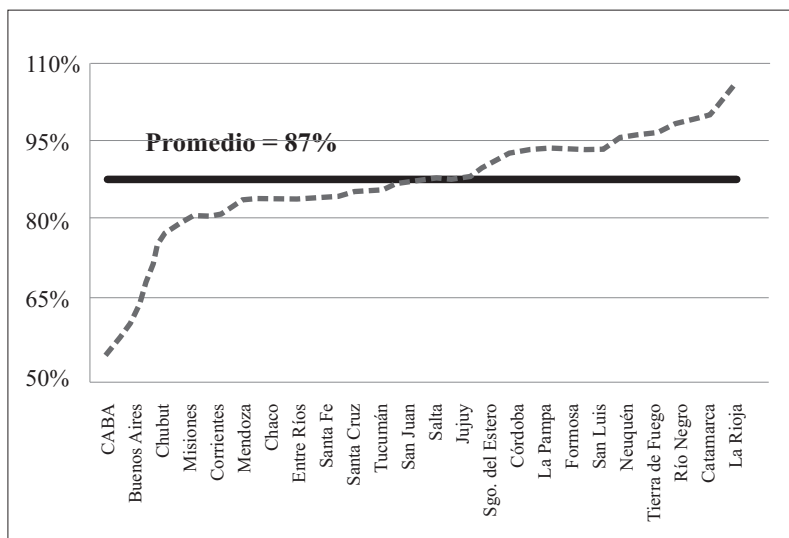
Fuente: datos de Tabla 8.

Figura 10. Participación (%) del nivel provincial en la disminución del Gini. Promedio 2003-2010.
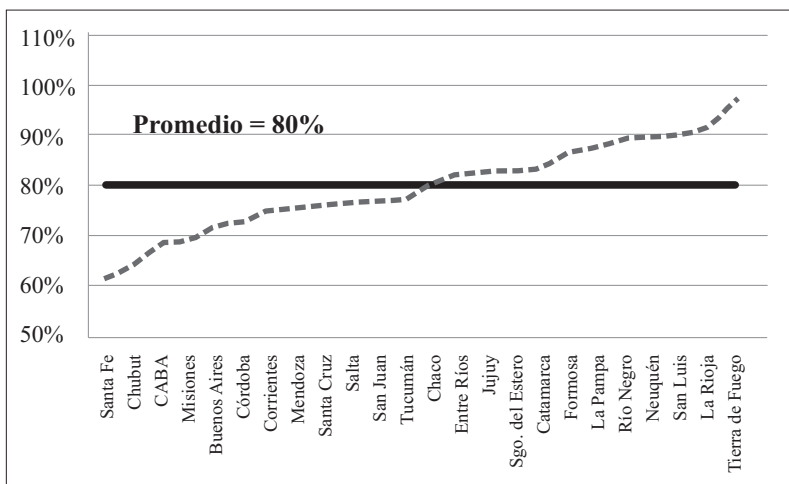
3.6. Contribución de los presupuestos nacional y provinciales a la progresividad.

Las Tablas 10 a 12 resumen la contribución de los presupuestos nacional y provinciales a la progresividad. La progresividad para el total país (1995-2010) es el resultado de gastos progresivos (0,102) e impuestos regresivos (-0,023). Los gastos provinciales dan cuenta del 66% de la progresividad total de los gastos. Los impuestos nacionales explican la regresividad impositiva, mientras que los impuestos provinciales contribuyen muy poco. Los gastos provinciales son más progresivos que los nacionales: el coeficiente promedio de Kakwani es igual a 0,476 en el primer caso y 0,235 en el segundo (debido a que educación y salud representan un alto porcentaje del gasto provincial). La progresividad de la política fiscal es creciente, debido a la progresividad de los gastos, tanto nacionales como provinciales (compensada solo parcialmente por la regresividad de los impuestos).[81] Los instrumentos que producen la reducción en la desigualdad en las provincias son diferentes.

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81. En Cont y Porto (2016 a) se presenta gráficamente la evolución por provincias y para todos los años de las distintas variables Sección V. graficos 2.1 a 2.24).

El mínimo cambio en el coeficiente Gini (para todo el período) se da en la ciudad de Buenos Aires (RS=-0,056). Esta progresividad es el resultado de gastos progresivos (0,058) e impuestos neutrales (-0,001). Los gastos locales dan cuenta del 62% de la progresividad total de los gastos (explicados fuertemente por el coeficiente de Kakwani del gasto)

El máximo cambio en el coeficiente Gini se da en La Rioja (RS=-0,147). Esta progresividad es el resultado de gastos progresivos (0,167) e impuestos regresivos (-0,022). Los gastos provinciales dan cuenta del 88% de la progresividad total de los gastos. Los impuestos nacionales explican el 80% de la regresividad impositiva. Los gastos provinciales son los que explican la progresividad del gasto, dado que el gasto nacional es levemente progresivo a neutral (Kg$_N$=0,020).

El cambio en el coeficiente Gini de Buenos Aires es similar al del promedio nacional (RS=-0,081). Esta progresividad es el resultado de gastos progresivos (0,087) e impuestos prácticamente neutrales (-0,004). Los gastos provinciales dan cuenta del 65% de la progresividad total de los gastos. Por su parte, el cambio en el coeficiente Gini de Córdoba es levemente inferior al del promedio nacional (RS=-0,074). Esta progresividad es el resultado de gastos progresivos (0,098) e impuestos regresivos (-0,026). Los gastos provinciales dan cuenta del 68% de la progresividad total de los gastos, mientras que los impuestos nacionales explican el 69% de la regresividad impositiva.

4. Explicando los hechos. Exploración preliminar.

4.1. Variable explicada: Gini ex ante.

4.2. La desigualdad resultante del mercado y el producto per cápita de mercado.

Un tema de interés es la relación entre la desigualdad en la distribución del ingreso de mercado (ex ante, esto es, sin intervención gubernamental) y el producto bruto per cápita de mercado en cada provincia. La referencia es la curva de Kuznets (1955), que estudia el nexo entre la desigualdad y el ingreso per cápita. Esta relación ha merecido atención a lo largo del tiempo y aún en la actualidad sigue siendo tema de debate. Las estimaciones internacionales suelen encontrar una relación con forma de U invertida, significando que la desigualdad aumenta con el aumento del producto per cápita en un primer tramo y luego disminuye a medida que éste aumenta. Tal comportamiento obedece a que cuando las economías son muy pobres el ingreso está concentrado en pocas personas; esta concentración, debido a la alta propensión marginal al ahorro de los ricos genera volúmenes de ahorro que se traducen en inversión y favorecen el crecimiento del PBG. Los cambios en la estructura productiva tienen un rol central en la explicación: el desarrollo industrial gene-

ra incentivos para la migración desde zonas rurales (de bajos salarios) hacia zonas urbanas (altos salarios). Con este proceso las diferencias salariales disminuyen y también lo hace la desigualdad. En investigaciones posteriores se han encontrado distintos resultados por el agregado de nuevas variables explicativas (por ejemplo, imperfecciones en los mercados de capitales, informalidad, políticas e instituciones), por la redefinición de la variable dependiente (desigualdad social) y a partir de la aplicación de métodos de estimación alternativos. Trabajos que confirman la regularidad de Kuznets son, entre otros, Barro (2000), de Gregorio y Lee (2002) y Gasparini *et al*. (2013) para un panel de países; Amendola y Dell'Anno (2010) y Alejo (2012) para América Latina. Sin embargo, en general el poder explicativo es bajo.

La Figura 11 representa la relación entre el Gini ex ante y el PBG provincial per cápita para el promedio 1995-2010 para las 24 jurisdicciones argentinas. Por su parte, el Cuadro 1 presenta los resultados de una estimación que relaciona estas dos variables (ecuación #1). La relación aislada, con forma cuadrática, es opuesta a la obtenida por los autores mencionados antes. Sin embargo, la Figura muestra dos resultados interesantes. Primero, el ajuste a los datos refleja la parte decreciente de la forma cuadrática entre entre PBG per cápita y Gini ex ante, esto es, solamente se refleja el tramo de reducción de la desigualdad. Esto no debería sorprender para países que ya sobrepasaron la fase inicial de desarrollo considerada por Kuznetz. Se-

Figura 11. Gini ex ante y PBG per cápita, período 1995-2010.
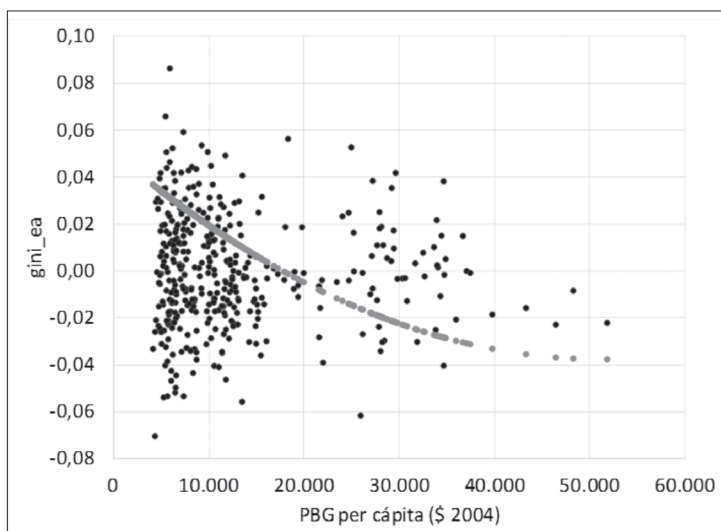
Nota: el coeficiente Gini está centrado sobre el promedio del total país para cada año.

gundo, la relación es convexa (nuevamente, en el conjunto de datos), reflejando costos crecientes –en términos de incrementos de nivel de ingresos– para reducir un punto adicional de desigualdad.[82] Más adelante se discute la robustez de este resultado.

Cuadro 1. Gini ex ante: regresiones con efectos separados.

	(#1)	(#2)	(#3)	(#4)	(#5)
PBG real$_{pc}$	-3.427***				
PBG real$_{pc}^2$	33.40*				
Kofa		0.272***			
Kofa^2		-0.619***			
Apertura			0.126***		
Apertura^2			-0.0918**		
ed_sec				2.112***	
ed_sec^2				-5.779***	
alfab					20.31**
alfab^2					-10.33**
Constante	0.497***	0.445***	0.444***	0.279***	-9.516**
Observaciones	384	384	384	384	384
R^2	0.045	0.063	0.079	0.079	0.054
Nro. provincias	24	24	24	24	24

Estimación con datos de panel, seleccionando fixed effect or random effect a través del Test de Hausman. Aclaraciones: estadístico p-value identificado con asteriscos, tal que *** $p<0,01$, ** $p<0,05$, * $p<0,10$. Los resultados son robustos a transformaciones del Gini (que evitan acotar su valor entre 0 y 1) y a transformaciones del ingreso (en logaritmo natural).

4.1.2. Apertura económica, globalización y desigualdad.

La apertura económica y la globalización, posibilitadas por la disminución de los costos del transporte y las comunicaciones y por la revolución informática, han dado lugar a una creciente preocupación por su impacto sobre la distribución del ingreso de mercado. La idea es que hay individuos y regiones que pueden resultar perjudicados, especialmente en aquellas regiones que no tienen claras ventajas comparativas en el nuevo escenario y/o en las que las importaciones compiten con la producción local, y para aquellas personas con menor educación y especialización. Es por ello que la desigualdad aumentaría al menos en las primeras etapas. Sin em-

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82. Esta observación es importante ya que es una explicación lógica a la relación entre ingreso y desigualdad a medida que el ingreso aumenta desde niveles elevados. Si la relación fuese de U invertida, eventualmente un peso más de ingreso estaría acompañado de una reducción en la desigualdad marginalmente creciente.

bargo, la adaptación productiva y de los recursos humanos, el desarrollo de nuevos productos y servicios pueden corregir el sentido de la relación. En consecuencia es de esperar una "curva de apertura y globalización" similar a la curva de Kuznets, es decir, con forma de U invertida.

La evidencia empírica a nivel de países no ha arrojado resultados robustos; en algunos casos la desigualdad ha aumentado y en otros ha disminuido (Collins, 1996; Burtless y Shapiro, 1998; Ades y Glaeser, 1999; Banco Mundial, 2013. Un trabajo reciente (Goldberg and Pavcnick, 2016) presenta evidencia de aumento de la globalización y de la desigualdad en la mayoría de los países emergentes.

La Figura 12 presenta la relación entre el Gini ex ante y el índice de globalización KOFA nivel provincial para el promedio 1995-2010. Por su parte, la ecuación (#2) del Cuadro 1 muestra el vínculo entre Gini ex ante y el indicador de globalización, observándose una relación de curva de globalización (esto es, una relación con forma de U invertida).[83]

Figura 12. Gini ex ante y Globalización (Índice KOFA), período 1995-2010.

Nota: el coeficiente Gini está centrado sobre el promedio del total país para cada año.

4.1.3. Nivel educativo y desigualdad.

En trabajos realizados en el país y en el exterior se documenta la relación inversa entre nivel educativo y la desigualdad de los ingresos. De Gregorio and Lee (2002), por ejemplo, presentan evidencia del impacto de la educación sobre la distribución del ingreso para un amplio conjunto de países entre 1960 y 1990, reflejando que la educación juega un papel importante en disminuir la desigualdad.

El Cuadro 1 sintetiza estimaciones de esta relación a partir de dos medidas de educación de los recursos humanos: el porcentaje de población de 15 años y más con educación secundaria completa (*ed_sec*) y el de población alfabeta de 14 años o más (*alfab*).[84] Las ecuaciones (#4) y (#5) del Cuadro 1 muestran una relación de U invertida como la que se ilustra para el indicador de educación secundaria en la Figura 13 (el gráfico para alfabetismo es cualitativamente similar), reflejando que a partir de cierto nivel de nivel educativo la desigualdad disminuye.

Figura 13. Gini ex ante y nivel educativo (educación secundaria), período 1995-2010.
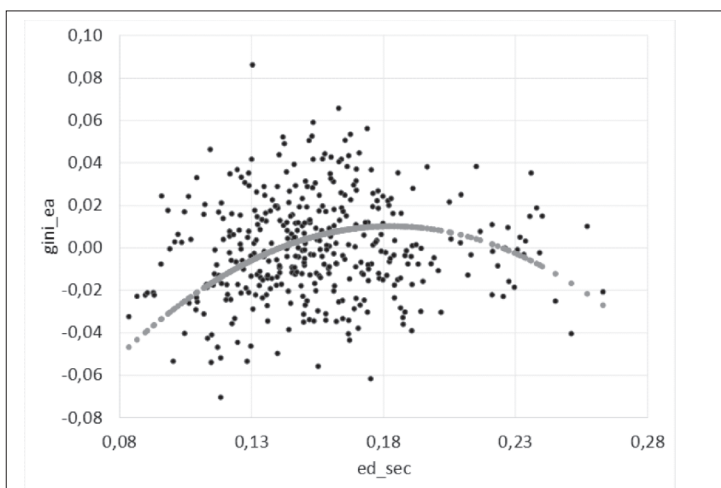
Nota: el coeficiente Gini está centrado sobre el promedio del total país para cada año.

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83. -*continuación de la página anterior.-* internacionales firmados por la provincias y oficinas provinciales en países extranjeros).
   Si se sustituye el índice KOFA por el de Apertura Económica (Exportaciones/PBG) los resultados se mantienen (ver ecuación #3 del).
84. Se agradece al Mg. Mauricio Grotz el habernos facilitado la información sobre estas dos medidas de capital humano. Estas medidas fueron utilizadas por Grotz y Llach en el estudio de convergencia de las provincias argentinas (2013).

4.1.4. Interacciones entre ingreso, apertura y nivel educativo.

El Cuadro 2 expande las tres relaciones analizadas por separado (en el Cuadro 1) para incorporar interrelaciones entre ellas.[85] En primer lugar, los resultados de Gini ex ante e ingresos son robustos a configuraciones que introducen relaciones con variables de apertura comercial (KOFA) y de educación (*ed_sec*). Por su parte, la relación entre el Gini ex ante y el indicador de globalización provincial KOFA también es robusta a configuraciones que introducen interrelaciones con educación.

Cuadro 2. Gini ex ante: interacciones.

	(#6)	(#9)	(#12)
PBG real$_{pc}$	-3.923***	-7.373***	
PBG real$_{pc}^2$	43.38**	80.31***	
Kofa	0.235***	0.096*	0.181***
Kofa^2	-0.498***	-0.247**	-0.472***
ed_sec		2.599***	1.884***
ed_sec^2		-6.247***	-4.981***
Constante	0.486***	0.284***	0.285***
Observaciones	384	384	384
R^2	0.098	0.225	0.123
Nro. provincias	24	24	24

Estimación con datos de panel, seleccionando fixed effect or random effect a través del Test de Hausman. Aclaraciones: estadístico p-value identificado con asteriscos, tal que *** p<0,01, ** p<0,05, * p<0,10.

4.2. Variable explicada: Gini ex post.

El Cuadro 3 replica las regresiones corridas para el Gini ex ante en el Cuadro 1. En primer lugar, la relación entre el Gini ex post y la variable de ingreso es nuevamente cuadrática, pero a diferencia del caso del Gini ex ante, el ajuste adopta la forma de U (Figura14). Esto indicaría que el efecto de la política fiscal, sin controlar por otras variables, estaría aumentando la desigualdad ex post en unidades de ingreso (provincias) de altos ingresos.

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85. El cuadro presenta las interrelaciones entre PBG per cápita, KOFA y ed_sec. Las interrelaciones son cualitativamente similares si se reemplaza el indicador KOFA por el de apertura comercial, y si se reemplaza el indicador de educación secundaria por el de alfabetismo.

**Figura 14. Gini ex post y PBG per cápita,
período 1995-2010.**
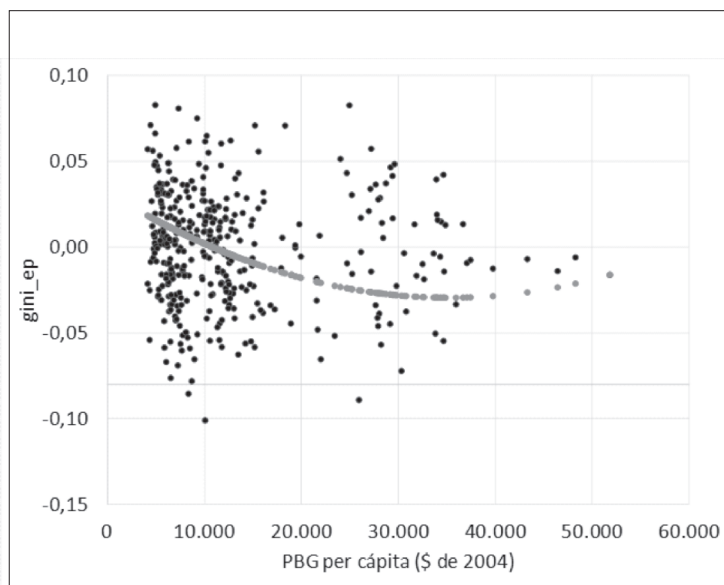
Nota: el coeficiente Gini está centrado sobre el promedio del total país para cada año.

En segundo lugar, la relación entre el índice KOFA y el Gini ex post es cualitativamente similar al caso del Gini ex ante (U invertida, con un máximo en niveles intermedios de apertura; ver ecuación #2 del Cuadro 3).[86] La relación entre el Gini ep y la proporción de personas con secundaria completa presenta resultados disímiles. La estructura cuadrática deja de ser significativa (#4 del Cuadro 3), aunque el estimador puntual produce una relación negativa para el rango observado de la variable educativa. Este resultado se reitera al asumir una relación lineal, cuyo coeficiente resulta significativo y presenta el signo negativo. En síntesis, estos resultados están más en línea con los obtenidos por de Gregorio y Lee (2002) mencionados anteriormente. La relación con la variable *alfab* tiene forma de U invertida (ecuación #5).

Por último, en el análisis de distintas variables con el Gini ex post se incorpora

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86. En cambio, la relación entre el Gini ep y el indicador de Apertura Comercial cambia de sentido aunque pierde significatividad estadística (ecuación #3 del Cuadro 3).

Cuadro 3. Gini ex post: regresiones con efectos separados.

	(#1)	(#2)	(#3)	(#4)	(#5)	(#6)
PBG real$_{pc}$	-3.479***					
PBG real$_{pc}$	49.30***					
Kofa		0.162**				
Kofa^2		-0.640***				
Apertura			-0.0127			
Apertura^2			0.00505			
ed_sec				0.0503		
ed_sec^2				-2.601		
alfab					46.70***	
alfab^2					-25.46***	
sub_democ						0.008**
Constante	0.388***	0.352***	0.358***	0.413***	-20.99***	0.358***
Observaciones	384	384	384	384	384	91
R^2	0.125			0.130	0.172	
Nro. provincias	24	24	24	24	24	24

Estimación con datos de panel, seleccionando fixed effect or random effect a través del Test de Hausman. Aclaraciones: estadístico p-value identificado con asteriscos, tal que *** p<0,01, ** p<0,05, * p<0,10. Los resultados son robustos a transformaciones del Gini (que evitan acotar su valor entre 0 y 1) y a transformaciones del ingreso (en logaritmo natural).

la variable proxy de libertades cívicas, denominada, sub_democ (ecuación #6).[87] Esta variable reflejaría el control que tiene el sector más rico de la sociedad y de la influencia de ese sector en la distribución del ingreso (Muinello-Gallo and Roca-Sagalés, 2013). Pese a que en el caso del Gini ex ante esta relación no resultaba significativa, se detecta una relación positiva entre el nivel democrático provincial y la desigualdad ex post en la distribución del ingreso. Esta relación es contraria a lo esperado y contraria a la obtenida por los autores antes mencionados.[88]

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87. Fuente: Gervasoni (2010, 2011). La variable sub_democ es un índice de democracia provincial para las provincias argentinas, durante años seleccionados en el período 1987-2007. Se agradece al autor en habernos facilitado datos complementarios a los que se encuentran en los trabajos citados.

88. Se realizó un análisis de robustez de los coeficientes como el realizado para el Gini ex ante (Cuadro 2). En general los resultados son robustos, con excepción de la interacción con la variable de democracia. Como cambia el tamaño de la muestra al incorporar esta variable (de 384 observaciones a 91 observaciones) se omite esta interacción en la comparación. Un cuadro similar al Cuadro 2 está disponible a solicitud del interesado.

En esta sección se avanza con el análisis de la relación entre distintas dimensiones de la política fiscal y el Gini ex post. Para ello, se realizaron diversas estimaciones entre la medida de desigualdad y dimensiones de la política fiscal. Las variables fiscales incorporadas en el análisis se encuentran definidas en precios constantes de 2004 per cápita por lo que se encuentran en línea con la medición del ingreso. Por su parte, se utilizó el coeficiente Reynolds-Smolensky que resulta de la ejecución de la política fiscal. El Cuadro 4 presenta los resultados, interactuando estas dimensiones con la variable de ingreso. Los resultados más importantes se detallan a continuación.

Cuadro 4. Gini ex post: interacciones (ingreso y variables de política fiscal).

|	(#1)	(#2)	(#3)	(#4)	(#5)	(#6)
PBG real $_{pc}$	-3.374***	-3.994***	-0.198	0.0267	-0.520	-1.512
PBG real $_{pc}^2$	34.29*	43.66**	21.45	21.32	30.20*	36.64**
Reynolds-Smolensky	-0.863***	-0.822***	-0.526***	-0.377***	-0.400***	-0.507***
Residuo $_{pc}$		-6,416***				
Recursos Totales $_{pc}$			610.6			
Gastos Totales $_{pc}$			-10,204***			
Gastos Nacionales $_{pc}$				-12,691***		
Gastos Provinciales $_{pc}$				-11,162***		
Recursos Provinciales $_{pc}$				13,183***		
Recursos Nacionales $_{pc}$				-6,530***		
Gastos Serv. Sociales $_{pc}$					-4,715	
Gastos Admin. $_{pc}$					6.684	
Gastos Serv. Econ. $_{pc}$					-19,136***	
Recursos PCT $_{pc}$					10,346***	
Recursos IA $_{pc}$					-37,126***	
Recursos Resto $_{pc}$					9,077	
Gastos Especie $_{pc}$						-10,208***
Gastos Efectivo $_{pc}$						14,441***
Rec. x Gastos Esp. $_{pc}$						7,529***
Rec. x Transf. Efec. $_{pc}$						-7,092***
Constante	0.482***	0.489***	0.457***	0.450***	0.446***	0.461***
Observaciones	384	384	384	384	384	384
R^2		0.534	0.592		0.638	0.652
Nro. provincias	24	24	24	24	24	24

Estimación con datos de panel, seleccionando fixed effect or random effect a través del Test de Hausman. Aclaraciones: estadístico p-value identificado con asteriscos, tal que *** $p<0,01$, ** $p<0,05$, * $p<0,10$

En primer lugar, una vez incorporado el Reynolds-Smolensky, el efecto ingreso preserva los signo y significatividad obtenidos en el Cuadro 1 (con dos excepciones). Una vez introducido el efecto redistributivo de la política fiscal, la dimensión ingreso vuelve a tener el rol analizado para la distribución del ingreso ex ante (esto es, el tramo de la U de Kuznetz que relaciona mayor ingreso con menor desigualdad desigualdad).[89]

En segundo lugar, de la ecuación (#2) del Cuadro 4 se observa que, una vez controlado el efecto redistributivo, la relación entre el residuo fiscal (mayor déficit) y la desigualdad ex post es negativa, resultado razonable de una política económica redistributiva. Así, esta ecuación captura los efectos "nivel" (déficit) y "redistributivo" (Reynolds-Smolensky) de la ejecución presupuestaria.

En tercer lugar, la ecuación (#3) descompone el residuo fiscal en recursos totales y gastos totales. La dimensión gastos es la más importante en la contribución a reducir la desigualdad.

En cuarto lugar, se realizaron tres aperturas para obtener mayor información respecto la relación entre las dimensiones de la política fiscal y la desigualdad ex post. La primera de ellas es la desagregación a nivel nacional y provincial (ecuación #4). Los resultados sugieren que cuanto mayores son los gastos nacionales, gastos provinciales y recursos nacionales, menor es el Gini ex post. Los recursos provinciales actúan en sentido inverso.

La segunda desagregación consiste en separar los gastos en servicios sociales, económicos y administración, por un lado, y recursos en producción-consumo-transacciones (PCT), ingreso-activos (IA) y otros (O), por otro lado. Los resultados obtenidos en la ecuación (#5) indican que los recursos sobre ingresos y activos y los gastos en servicios económicos presentan una relación negativa y significativa con la desigualdad ex post. Resulta llamativo que el gasto en servicios sociales tenga baja significatividad.[90]

La última desagregación separa los gastos según correspondan a transferencia de dinero o en especie, y recursos según sean directos o indirectos (asociados a la

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89. Las dos excepciones corresponden a la descomposición de los presupuestos en nación-provincias y gastos por finalidad y funciones. De cualquier manera, la significatividad de estos efectos es baja.

90. Al desagregar la estimación (#5) en los componentes de gasto y recursos se pudo detectar que, individualmente, el gasto social es significativo, pero dicha significatividad se pierde cuando este gasto interactúa con recursos (en particular, impuestos a los ingresos y activos). La evidencia aportaría a la hipótesis de contribución del gasto social a mejorar la distribución del ingreso (en línea con de Gregorio y Lee, 2002).

apertura de gastos bajo consideración). Todas las variables resultaron significativas siendo los gastos en especie y los recursos asociados a transferencias en efectivo (recursos cobrados directamente a los individuos) las variables que mayor relación negativa tienen con la desigualdad ex post. Nuevamente, resulta llamativo la relación positiva entre gastos en transferencias monetarias y la desigualdad ex post (resultado que no se revierte al considerar gastos por separado). Este resultado es importante pues la política fiscal, tal como se vió en III.4, cambió el mix de instrumentos hacia estas transferencias.

5. Observaciones finales.

El objetivo de este trabajo es estudiar la geografía de la distribución personal del ingreso y del impacto distributivo de la política fiscal en la Argentina. Las unidades de observación son los quintiles de ingreso per cápita dentro de cada una de las 24 jurisdicciones subnacionales y el período de análisis es 1995-2010. Las mediciones se realizan para el ingreso de mercado y para el ingreso post-política fiscal. El trabajo contiene dos conjuntos de aportes, los correspondientes a la contabilidad de la geografía de la distribución personal del ingreso y del impacto de la política fiscal, y los que buscan explicaciones a los hechos estilizados.

En cuanto al primer grupo de resultados (geografía de la distribución personal del ingreso), se destaca que la desigualdad del ingreso de mercado varía entre provincias. Sin embargo, el promedio para el conjunto de provincias es relativamente similar entre 1995-2001 y 2003-2010. Por su parte, se identifica un fuerte impacto la política fiscal sobre la desigualdad (el Gini promedio disminuye 0,106 puntos para el promedio 1995-2010). Este impacto es muy diferente entre provincias y provoca un importante reordenamiento en el ranking de desigualdad ex post, comparado con el que resulta del mercado. Se detecta un cambio en el mix de instrumentos fiscales redistributivos en favor de las transferencias en dinero vs las transferencias en especie. En cuanto a la composición de presupuesto nacional vs provinciales, para el período completo (1995-2010) el 83% de la disminución del Gini se debe a la ejecución presupuestaria de los gobiernos provinciales, con claras diferencias entre sub-períodos. El aporte de los presupuestos provinciales a la reducción en la desigualdad pasó del 87% en 1995-2001 en 1995-2001 al 80% en 2003-2010, adjudicable a la centralización fiscal en el último período. Entre los instrumentos de gasto y recaudación, el gasto provincial es 66% más progresivo que el nacional. Por último, la regresividad de los impuestos se debe fundamentalmente a los tributos del gobierno nacional.

El segundo grupo de resultados corresponde a estimaciones de la relación entre la desigualdad y variables de ingreso, apertura económica, nivel educativo, fisca-

les y de progresividad de la ejecución presupuestaria. En primer lugar, se observa una relación negativa entre el PBG per cápita real y la desigualdad ex ante, capturando la relación del efecto de Kuznets que vincula un aumento en el ingreso con la reducción en la desigualdad. La relación con las variables de globalización y de educación presentan una relación más general de U invertida, en línea con las propuestas teóricas y con parte de la evidencia empírica que la soporta. En segundo lugar, la ejecución presupuestaria modifica la relación entre el nivel de ingreso y desigualdad ex post, principalmente en las unidades económicas de mayor ingreso (cuyo ingreso correlaciona positivamente con la desigualdad). También modifica la relación entre el nivel educativo y la desigualdad, que se torna negativa (en línea con los resultados de la literatura empírica), pero no genera efectos significativos en la relación entre apertura y desigualdad. Al comparar con la desigualdad ex post, se identifica una correlación positiva entre el nivel democrático provincial y la desigualdad ex post en la distribución del ingreso (inexistente al comparar con la desigualdad ex ante), que es contraria a lo esperado y a los resultados obtenidos por otros autores. Por último, se analizó el efecto de la ejecución presupuestaria sobre la desigualdad ex post, capturando un efecto "nivel" (déficit y sus componentes) y un efecto "redistributivo" (Reynolds-Smolensky). El efecto redistributivo es el esperado, en cuando a corresponder con una menor desigualdad ex post. Dentro del efecto nivel se destaca la ejecución del gasto (y, a su vez, los gastos nacionales y gastos provinciales) pero no tanto los recursos (adquiriendo relevancia los recursos nacionales solamente). Considerando una descomposición funcional del gasto (servicios sociales, económicos y administración) y una descomposición de recursos en producción-consumo-transacciones, ingreso-activos y resto, se identifica un efecto nivel por la vía de la recaudación sobre ingresos y activos y gastos en servicios económicos (los gastos sociales tienen menor significatividad por la vía del efecto nivel); mientras que si se adopta una descomposición del gasto en transferencias de dinero o en especie, y de recursos según sean directos o indirectos, el efecto nivel se identifica por la vía de gastos gastos en especie y recursos cobrados directamente a los individuos.

Tres temas importantes no son abordados en este trabajo y quedan pendiente para futura investigación. Primero, una vez que se obtuvo una distribución del ingreso ex ante y ex post, explorando los determinantes asumiendo que la política fiscal es exógena, es natural continuar explorar los determinantes conjuntos de crecimiento económico, política fiscal y desigualdad (ver por ejemplo, Benabou, 2000, y Muinelo-Gallo y Roca-Sagalés, 2013). Segundo, un aspecto omitido en otros trabajos de los autores (ver Cont y Porto, 2016 b), es que el impacto distributivo de la política fiscal puede afectar el ordenamiento de los individuos (efecto conocido co-

mo *reranking* en la literatura de progresividad de la política fiscal). Finalmente, el trabajo se centra en la desigualdad de ingresos monetarios y deja pendiente la cuestión, no menos importante, del impacto sobre los resultados (ingreso real dado por la cantidad de bienes y servicios que efectivamente están disponibles a nivel de quintiles de ingreso ex ante).

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Anexo de Tablas.

Tabla 1. Resumen de efectos RS: Argentina y jurisdicciones. Promedio 1995-2010.

Promedio 1995 - 2010								
	Gini ex ante	RS (en efectivo)	Gini interim	RS (en especie)	Gini ex post	RS	Gini ep/ Gini ea	RS efectivo/ (RS efectivo + RS especie)
CABA	0,436	-0,021	0,416	-0,035	0,380	-0,056	87,1%	38,1%
Buenos Aires	0,448	-0,029	0,419	-0,052	0,367	-0,081	81,8%	36,3%
Catamarca	0,463	-0,025	0,438	-0,100	0,338	-0,125	73,0%	19,8%
Córdoba	0,442	-0,023	0,419	-0,051	0,368	-0,074	83,2%	29,3%
Corrientes	0,481	-0,039	0,442	-0,080	0,363	-0,119	75,4%	30,7%
Chaco	0,513	-0,044	0,469	-0,100	0,369	-0,144	72,0%	28,7%
Chubut	0,446	-0,028	0,419	-0,063	0,356	-0,091	79,5%	31,2%
Entre Ríos	0,462	-0,029	0,433	-0,076	0,357	-0,104	77,2%	26,9%
Formosa	0,466	-0,034	0,432	-0,105	0,327	-0,139	70,3%	21,3%
Jujuy	0,479	-0,034	0,445	-0,108	0,337	-0,142	70,2%	23,1%
La Pampa	0,445	-0,030	0,415	-0,086	0,329	-0,116	73,9%	24,3%
La Rioja	0,465	-0,034	0,431	-0,113	0,318	-0,147	68,6%	18,9%
Mendoza	0,448	-0,029	0,419	-0,056	0,364	-0,085	81,0%	33,7%
Misiones	0,480	-0,031	0,449	-0,055	0,394	-0,086	82,0%	35,6%
Neuquén	0,469	-0,025	0,444	-0,033	0,411	-0,058	87,5%	45,5%
Río Negro	0,490	-0,025	0,465	-0,074	0,391	-0,099	79,7%	25,2%
Salta	0,503	-0,050	0,454	-0,091	0,363	-0,141	72,0%	34,4%
San Juan	0,474	-0,045	0,429	-0,097	0,332	-0,142	69,9%	31,4%
San Luis	0,443	-0,029	0,415	-0,050	0,364	-0,079	82,1%	33,6%
Santa Cruz	0,406	-0,017	0,389	-0,059	0,329	-0,076	81,2%	23,6%
Santa Fe	0,444	-0,021	0,423	-0,062	0,361	-0,083	81,3%	25,1%
Santiago del Estero	0,464	-0,037	0,427	-0,092	0,334	-0,130	72,1%	27,2%
Tucumán	0,486	-0,045	0,442	-0,091	0,351	-0,135	72,3%	31,9%
Tierra del Fuego	0,424	-0,021	0,403	-0,066	0,337	-0,087	79,4%	23,8%
Promedio provincias	**0,462**	**-0,031**	**0,431**	**-0,075**	**0,356**	**-0,106**	**77,2%**	**29,2%**
Máximo	0,513	-0,017	0,469	-0,033	0,411	-0,056	87,5%	45,5%
Mínimo	0,406	-0,050	0,389	-0,113	0,318	-0,147	68,6%	18,9%
Max/Min	1,263	0,349	1,207	0,293	1,292	0,382	1,275	2,413
Coef. De variación	0,054	0,280	0,044	0,312	0,066	0,280	0,073	0,220

Fuente: elaboración propia. RS: Reynolds-Smolensky; ea: ex ante; ep: ex post.

El valor de "Promedio provincias" se define como el promedio simple de los Ginis provinciales. En todas las Tablas, cuando los valores son negativos, el cálculo de la relación entre el máximo y el mínimo se realiza tomando los valores absolutos.

Tabla 2. Resumen de efectos RS: Argentina y jurisdicciones. Promedio 1995-2001.

	Gini ex ante	RS (en efectivo)	Gini interim	RS (en especie)	Gini ex post	RS	Gini ep/ Gini ea	RS efectivo/ (RS efectivo + RS especie)
Promedio 1995 - 2001								
CABA	0,440	-0,020	0,420	-0,047	0,373	-0,066	84,9%	29,8%
Buenos Aires	0,447	-0,028	0,419	-0,063	0,357	-0,090	79,7%	30,7%
Catamarca	0,450	-0,017	0,433	-0,102	0,331	-0,118	73,7%	14,1%
Córdoba	0,431	-0,012	0,419	-0,043	0,376	-0,056	87,1%	22,2%
Corrientes	0,468	-0,019	0,449	-0,071	0,378	-0,090	80,9%	21,2%
Chaco	0,503	-0,025	0,478	-0,092	0,387	-0,116	76,9%	21,1%
Chubut	0,441	-0,022	0,419	-0,063	0,356	-0,085	80,7%	26,0%
Entre Ríos	0,458	-0,019	0,439	-0,078	0,361	-0,097	78,8/	19,8%
Formosa	0,459	-0,009	0,450	-0,098	0,351	-0,107	76,8%	8,1%
Jujuy	0,484	-0,022	0,462	-0,103	0,359	-0,125	74,2%	17,1%
La Pampa	0,427	-0,014	0,413	-0,071	0,342	-0,085	80,1%	16,7%
La Rioja	0,447	-0,005	0,442	-0,109	0,333	-0,114	74,6%	3,1%
Mendoza	0,448	-0,020	0,427	-0,057	0,370	-0,078	82,7%	26,3%
Misiones	0,480	-0,020	0,459	-0,064	0,395	-0,084	82,4%	24,2%
Neuquén	0,468	-0,020	0,448	-0,040	0,408	-0,060	87,3%	33,3%
Río Negro	0,496	-0,020	0,476	-0,072	0,404	-0,092	81,5%	21,5%
Salta	0,478	-0,032	0,446	-0,094	0,352	-0,126	73,6%	25,4%
San Juan	0,463	-0,033	0,430	-0,098	0,332	-0,131	71,6%	25,1%
San Luis	0,445	-0,012	0,433	-0,045	0,389	-0,057	87,3%	20,4%
Santa Cruz	0,402	-0,011	0,392	-0,037	0,354	-0,048	88,1%	22,5%
Santa Fe	0,431	-0,013	0,418	-0,049	0,369	-0,062	85,6%	21,7%
Santiago del Estero	0,441	-0,017	0,424	-0,097	0,327	-0,113	74,2%	14,8%
Tucumán	0,465	-0,028	0,437	-0,078	0,359	-0,106	77,2%	26,4%
Tierra del Fuego	0,427	-0,018	0,409	-0,061	0,347	-0,079	81,4%	22,8%
Promedio provincias	**0,454**	**-0,019**	**0,435**	**-0,072**	**0,363**	**-0,091**	**80,0%**	**21,4%**
Máximo	0,503	-0,005	0,478	-0,037	0,408	-0,048	88,1%	33,3%
Mínimo	0,402	-0,033	0,392	-0,109	0,327	-0,131	71,6%	3,1%
Max/Min	1,251	0,139	1,222	0,340	1,248	0,364	1,230	10,784
Coef. De variación	0,052	0,368	0,048	0,313	0,063	0,272	0,062	0,318

Tabla 3. Resumen de efectos RS: Argentina y jurisdicciones. Promedio 1995-2001.

Promedio 1995 - 2001							
	Gini ex ante	RS (en efectivo)	Gini interim	RS (en especie)	Gini ex post	RS	Gini ep/ Gini ea	RS efectivo/ (RS efectivo + RS especie)
CABA	0,431	-0,022	0,409	-0,026	0,383	-0,048	88,7%	45,5%
Buenos Aires	0,442	-0,030	0,412	-0,045	0,367	-0,075	82,8%	40,4%
Catamarca	0,471	-0,033	0,438	-0,101	0,337	-0,134	71,4%	24,8%
Córdoba	0,450	-0,033	0,417	-0,060	0,357	-0,093	79,2%	35,3%
Corrientes	0,490	-0,058	0,432	-0,089	0,343	-0,147	70,0%	39,5%
Chaco	0,519	-0,064	0,455	-0,110	0,345	-0,174	66,5%	36,4%
Chubut	0,448	-0,033	0,415	-0,068	0,347	-0,101	77,1%	33,9%
Entre Ríos	0,458	-0,038	0,420	-0,076	0,344	-0,114	75,0%	33,0%
Formosa	0,470	-0,059	0,410	-0,113	0,297	-0,172	63,3%	34,0%
Jujuy	0,473	-0,046	0,426	-0,115	0,312	-0,161	65,8%	28,8%
La Pampa	0,457	-0,045	0,412	-0,103	0,309	-0,148	67,4%	31,3%
La Rioja	0,478	-0,062	0,416	-0,118	0,298	-0,180	62,3%	33,5%
Mendoza	0,444	-0,037	0,408	-0,057	0,351	-0,094	78,7%	39,4%
Misiones	0,476	-0,041	0,435	-0,048	0,387	-0,089	81,3%	45,6%
Neuquén	0,463	-0,030	0,433	-0,030	0,403	-0,060	86,8%	52,8%
Río Negro	0,481	-0,030	0,451	-0,078	0,373	-0,108	77,4%	27,7%
Salta	0,520	-0,067	0,454	-0,092	0,362	-0,159	69,4%	42,0%
San Juan	0,479	-0,056	0,422	-0,096	0,326	-0,153	68,0%	37,1%
San Luis	0,440	-0,045	0,395	-0,056	0,339	-0,101	77,0%	45,6%
Santa Cruz	0,406	-0,023	0,383	-0,082	0,301	-0,105	74,2%	23,7%
Santa Fe	0,450	-0,028	0,422	-0,075	0,347	-0,103	76,9%	27,9%
Santiago del Estero	0,480	-0,057	0,423	-0,090	0,333	-0,147	69,5%	38,3%
Tucumán	0,505	-0,061	0,444	-0,105	0,340	-0,165	67,2%	36,8%
Tierra del Fuego	0,416	-0,024	0,392	-0,072	0,320	-0,096	76,9%	24,6%
Promedio provincias	**0,464**	**-0,043**	**0,422**	**-0,079**	**0,342**	**-0,122**	**73,9%**	**35,7%**
Máximo	0,520	-0,022	0,455	-0,026	0,403	-0,048	88,7%	52,8%
Mínimo	0,406	-0,067	0,383	-0,118	0,297	-0,180	62,3%	23,7%
Max/Min	1,281	0,331	1,189	0,224	1,355	0,269	1,424	2,228
Coef. De variación	0,061	0,339	0,044	0,333	0,082	0,310	0,097	0,209

Tabla 4. Reordenamiento de jurisdicciones. Promedio 1995-2010.

	Gini ex ante	Gini ex post	Ranking ex ante (de menor a mayor)	Ranking ex post (de menor a mayor)	Cambio de posición
Promedio 1995 - 2010					
CABA	0,436	0,380	3	21	-18
Buenos Aires	0,448	0,367	9	18	-9
Catamarca	0,463	0,338	12	9	3
Córdoba	0,442	0,368	4	19	-15
Corrientes	0,481	0,363	20	14	6
Chaco	0,513	0,369	24	20	4
Chubut	0,446	0,356	8	11	-3
Entre Ríos	0,462	0,357	11	12	-1
Formosa	0,466	0,327	15	2	13
Jujuy	0,479	0,337	18	8	10
La Pampa	0,445	0,329	7	3	4
La Rioja	0,465	0,318	14	1	13
Mendoza	0,448	0,364	10	16	-6
Misiones	0,480	0,394	19	23	-4
Neuquén	0,469	0,411	16	24	-8
Río Negro	0,490	0,391	22	22	0
Salta	0,503	0,363	23	15	8
San Juan	0,474	0,332	17	5	12
San Luis	0,443	0,364	5	17	-12
Santa Cruz	0,406	0,329	1	4	-3
Santa Fe	0,444	0,361	6	13	-7
Santiago del Estero	0,464	0,334	13	6	7
Tucumán	0,486	0,351	21	10	11
Tierra del Fuego	0,424	0,337	2	7	-5

Tabla 5. Reordenamiento de jurisdicciones. Promedio 1995-2001.

	Gini ex ante	Gini ex post	Ranking ex ante (de menor a mayor)	Ranking ex post (de menor a mayor)	Cambio de posición
Promedio 1995 - 2001					
CABA	0,440	0,373	6	17	-11
Buenos Aires	0,447	0,357	11	11	0
Catamarca	0,450	0,331	13	2	11
Córdoba	0,431	0,376	5	18	-13
Corrientes	0,468	0,378	18	19	-1
Chaco	0,503	0,387	24	20	4
Chubut	0,441	0,356	8	10	-2
Entre Ríos	0,458	0,361	14	14	0
Formosa	0,459	0,351	15	7	8
Jujuy	0,484	0,359	22	12	10
La Pampa	0,427	0,342	3	5	-2
La Rioja	0,447	0,333	10	4	6
Mendoza	0,448	0,370	12	16	-4
Misiones	0,480	0,395	21	22	-1
Neuquén	0,468	0,408	19	24	-5
Río Negro	0,496	0,404	23	23	0
Salta	0,478	0,352	20	8	12
San Juan	0,463	0,332	16	3	13
San Luis	0,445	0,389	9	21	-12
Santa Cruz	0,402	0,354	1	9	-8
Santa Fe	0,431	0,369	4	15	-11
Santiago del Estero	0,441	0,327	7	1	6
Tucumán	0,465	0,359	17	13	4
Tierra del Fuego	0,427	0,347	2	6	-4

Tabla 6. Reordenamiento de jurisdicciones. Promedio 2003-2010.

Promedio 2003 - 2010					
	Gini ex ante	Gini ex post	Ranking ex ante (de menor a mayor)	Ranking ex post (de menor a mayor)	Cambio de posición
CABA	0,431	0,383	3	22	-19
Buenos Aires	0,442	0,367	5	20	-15
Catamarca	0,471	0,337	14	9	5
Córdoba	0,450	0,357	8	18	-10
Corrientes	0,490	0,343	21	12	9
Chaco	0,519	0,345	23	14	9
Chubut	0,448	0,347	7	15	-8
Entre Ríos	0,458	0,344	11	13	-2
Formosa	0,470	0,297	13	1	12
Jujuy	0,473	0,312	15	5	10
La Pampa	0,457	0,309	10	4	6
La Rioja	0,478	0,298	17	2	15
Mendoza	0,444	0,351	6	17	-11
Misiones	0,476	0,387	16	23	-7
Neuquén	0,463	0,403	12	24	-12
Río Negro	0,481	0,373	20	21	-1
Salta	0,520	0,362	24	19	5
San Juan	0,479	0,326	18	7	11
San Luis	0,440	0,339	4	10	-6
Santa Cruz	0,406	0,301	1	3	-2
Santa Fe	0,450	0,347	9	16	-7
Santiago del Estero	0,480	0,333	19	8	11
Tucumán	0,505	0,340	22	11	11
Tierra del Fuego	0,416	0,320	2	6	-4

Tabla 7. Resumen de efectos RS: Provincias y Nación. Promedio 1995-2010.

	Promedio 1995 - 2010					
	Gini ex ante	RS Nación	RS Provincia	Gini ex post	% Nación	% Provincia
CABA	0,436	-0,022	-0,034	0,380	38,7%	61,3%
Buenos Aires	0,448	-0,027	-0,054	0,367	33,5%	66,5%
Catamarca	0,463	-0,012	-0,113	0,338	9,3%	90,7%
Córdoba	0,442	-0,015	-0,059	0,368	20,2%	79,8%
Corrientes	0,481	-0,027	-0,091	0,363	23,1%	76,9%
Chaco	0,513	-0,026	-0,118	0,369	17,8%	82,2%
Chubut	0,446	-0,028	-0,063	0,356	30,7%	69,3%
Entre Ríos	0,462	-0,017	-0,087	0,357	16,6%	83,4%
Formosa	0,466	-0,014	-0,125	0,327	10,4%	89,6%
Jujuy	0,479	-0,021	-0,121	0,337	14,9%	85,1%
La Pampa	0,445	-0,013	-0,104	0,329	10,8%	89,2%
La Rioja	0,465	-0,003	-0,143	0,318	2,3%	97,7%
Mendoza	0,448	-0,018	-0,067	0,364	20,9%	79,1%
Misiones	0,480	-0,022	-0,064	0,394	25,7%	74,3%
Neuquén	0,469	-0,004	-0,054	0,411	6,9%	93,1%
Río Negro	0,490	-0,006	-0,092	0,391	6,5%	93,5%
Salta	0,503	-0,026	-0,115	0,363	18,5%	81,5%
San Juan	0,474	-0,026	-0,116	0,332	18,2%	81,8%
San Luis	0,443	-0,007	-0,073	0,364	8,2%	91,8%
Santa Cruz	0,406	-0,017	-0,060	0,329	22,1%	77,9%
Santa Fe	0,444	-0,025	-0,058	0,361	30,6%	69,4%
Santiago del Estero	0,464	-0,018	-0,112	0,334	13,7%	86,3%
Tucumán	0,486	-0,027	-0,109	0,351	19,6%	80,4%
Tierra del Fuego	0,424	-0,003	-0,083	0,337	3,9%	96,1%
Promedio provincias	**0,462**	**-0,018**	**-0,088**	**0,356**	**16,7%**	**83,3%**
Máximo	0,513	0,028	0,143	0,411	38,7%	97,7%
Mínimo	0,406	0,003	0,034	0,318	2,3%	61,3%
Max/Min	1,263	8,236	4,164	1,292	16,53	1,59
Coef. De variación	0,054	0,472	0,331	0,066	0,574	0,115

Tabla 8. Resumen de efectos RS: Provincias y Nación. Promedio 1995-2001.

	Gini ex ante	RS Nación	RS Provincia	Gini ex post	% Nación	% Provincia
			Promedio 1995 - 2001.			
CABA	0,440	-0,030	-0,036	0,373	45,0%	55,0%
Buenos Aires	0,447	-0,036	-0,055	0,357	39,4%	60,6%
Catamarca	0,450	0,000	-0,118	0,331	0,4%	99,6%
Córdoba	0,431	-0,004	-0,052	0,376	6,9%	93,1%
Corrientes	0,468	-0,017	-0,073	0,378	19,1%	80,9%
Chaco	0,503	-0,019	-0,098	0,387	16,1%	83,9%
Chubut	0,441	-0,020	-0,065	0,356	23,2%	76,8%
Entre Ríos	0,458	-0,015	-0,082	0,361	15,7%	84,3%
Formosa	0,459	-0,007	-0,100	0,351	6,7%	93,3%
Jujuy	0,484	-0,015	-0,110	0,359	12,0%	88,0%
La Pampa	0,427	-0,006	-0,079	0,342	6,7%	93,3%
La Rioja	0,447	0,008	-0,122	0,333	-6,8%	106,8%
Mendoza	0,448	-0,013	-0,065	0,370	16,2%	83,8%
Misiones	0,480	-0,016	-0,068	0,395	19,4%	80,6%
Neuquén	0,468	-0,002	-0,057	0,408	4,0%	96,0%
Río Negro	0,496	-0,001	-0,090	0,404	1,3%	98,7%
Salta	0,478	-0,015	-0,111	0,352	12,2%	87,8%
San Juan	0,463	-0,016	-0,115	0,332	12,4%	87,6%
San Luis	0,445	-0,004	-0,053	0,389	6,5%	93,5%
Santa Cruz	0,402	-0,007	-0,041	0,354	14,7%	85,3%
Santa Fe	0,431	-0,010	-0,052	0,369	15,5%	84,5%
Santiago del Estero	0,441	-0,011	-0,103	0,327	9,3%	90,7%
Tucumán	0,465	-0,015	-0,091	0,359	14,1%	85,9%
Tierra del Fuego	0,427	-0,003	-0,077	0,347	3,5%	96,5%
Total país	**0,454**	**-0,011**	**-0,080**	**0,363**	**12,5%**	**87,5%**
Máximo	0,503	0,036	0,122	0,408	45,0%	106,8%
Mínimo	0,402	0,000	0,036	0,327	0,4%	55,0%
Max/Min	1,251	74,629	3,332	1,248	111,67	1,94
Coef. De variación	0,052	0,844	0,323	0,063	0,908	0,130

Tabla 9. Resumen de efectos RS: Provincias y Nación. Promedio 2003-2010.

Promedio 2003 - 2010.					
	Gini ex ante	RS Nación	RS Provincia	Gini ex post	% Nación	% Provincia
CABA	0,431	-0,015	-0,033	0,383	31,9%	68,1%
Buenos Aires	0,442	-0,021	-0,054	0,367	28,4%	71,6%
Catamarca	0,471	-0,022	-0,112	0,337	16,3%	83,7%
Córdoba	0,450	-0,026	-0,067	0,357	27,5%	72,5%
Corrientes	0,490	-0,038	-0,109	0,343	25,6%	74,4%
Chaco	0,519	-0,034	-0,140	0,345	19,5%	80,5%
Chubut	0,448	-0,037	-0,065	0,347	36,3%	63,7%
Entre Ríos	0,458	-0,020	-0,093	0,344	17,9%	82,1%
Formosa	0,470	-0,023	-0,150	0,297	13,1%	86,9%
Jujuy	0,473	-0,028	-0,133	0,312	17,4%	82,6%
La Pampa	0,457	-0,019	-0,129	0,309	12,9%	87,1%
La Rioja	0,478	-0,014	-0,165	0,298	8,1%	91,9%
Mendoza	0,444	-0,023	-0,070	0,351	25,0%	75,0%
Misiones	0,476	-0,028	-0,061	0,387	31,6%	68,4%
Neuquén	0,463	-0,006	-0,054	0,403	10,6%	89,4%
Río Negro	0,481	-0,012	-0,097	0,373	10,6%	89,4%
Salta	0,520	-0,038	-0,121	0,362	23,6%	76,4%
San Juan	0,479	-0,036	-0,117	0,326	23,4%	76,6%
San Luis	0,440	-0,010	-0,091	0,339	9,6%	90,4%
Santa Cruz	0,406	-0,025	-0,080	0,301	24,1%	75,9%
Santa Fe	0,450	-0,040	-0,063	0,347	39,1%	60,9%
Santiago del Estero	0,480	-0,025	-0,121	0,333	17,3%	82,7%
Tucumán	0,505	-0,038	-0,127	0,340	23,2%	76,8%
Tierra del Fuego	0,416	-0,003	-0,093	0,320	3,1%	96,9%
Total país	0,464	-0,024	**-0,098**	**0,342**	**19,9%**	**80,1%**
Máximo	0,520	0,040	0,165	0,403	39,1%	96,9%
Mínimo	0,406	0,003	0,033	0,297	3,1%	60,9%
Max/Min	1,281	13,645	5,009	1,355	12,65	1,59
Coef. De variación	0,061	0,439	0,355	0,082	0,466	0,116

Tabla 10. Coeficientes de Reynolds-Smolensky y sus determinantes. Presupuestos Nacional y Provinciales. Promedio 1995-2010.

1995-2010	g	gN	KgN	gN/(1-t+g)	gP	KgP	gP/(1-t+g)	t	tN	KtN	tN/(1-t+g)	tP	KtP	tP/(1-t+g)	RSp
Ciudad de Bs. As.	0,058	0,022	0,232	0,096	0,036	0,683	0,052	-0,001	0,000	0,000	0,127	-0,001	-0,022	0,048	0,056
Buenos Aires	0,087	0,030	0,195	0,156	0,056	0,455	0,123	-0,004	-0,002	-0,008	0,235	-0,002	-0,031	0,073	0,081
Catamarca	0,147	0,026	0,134	0,193	0,121	0,502	0,241	-0,022	-0,015	-0,073	0,210	-0,007	-0,121	0,056	0,125
Córdoba	0,098	0,032	0,214	0,148	0,067	0,405	0,165	-0,026	-0,018	-0,076	0,240	-0,008	-0,094	0,085	0,074
Corrientes	0,143	0,049	0,246	0,198	0,095	0,409	0,231	-0,026	-0,021	-0,089	0,236	-0,005	-0,075	0,062	0,119
Chaco	0,180	0,055	0,271	0,202	0,125	0,406	0,308	-0,038	-0,029	-0,126	0,233	-0,008	-0,108	0,079	0,144
Chubut	0,117	0,026	0,184	0,141	0,091	0,416	0,220	-0,026	0,001	0,003	0,238	-0,027	-0,197	0,136	0,091
Entre Ríos	0,132	0,037	0,214	0,172	0,096	0,399	0,240	-0,028	-0,019	-0,086	0,226	-0,009	-0,095	0,090	0,104
Formosa	0,180	0,046	0,260	0,177	0,134	0,360	0,371	-0,044	-0,032	-0,163	0,199	-0,012	-0,183	0,063	0,139
Jujuy	0,169	0,044	0,209	0,210	0,125	0,503	0,248	-0,028	-0,023	-0,110	0,210	-0,005	-0,119	0,038	0,142
La Pampa	0,142	0,027	0,149	0,178	0,115	0,409	0,282	-0,025	-0,013	-0,056	0,225	-0,013	-0,117	0,107	0,116
La Rioja	0,167	0,020	0,082	0,238	0,148	0,482	0,307	-0,022	-0,017	-0,090	0,195	-0,004	-0,106	0,041	0,147
Mendoza	0,110	0,032	0,192	0,168	0,078	0,517	0,151	-0,026	-0,015	-0,067	0,221	-0,011	-0,148	0,074	0,085
Misiones	0,114	0,043	0,302	0,143	0,071	0,362	0,196	-0,027	-0,021	-0,106	0,198	-0,006	-0,113	0,054	0,086
Neuquén	0,108	0,016	0,211	0,076	0,092	0,435	0,212	-0,050	-0,012	-0,104	0,113	-0,038	-0,255	0,151	0,058
Río Negro	0,130	0,024	0,140	0,173	0,106	0,552	0,192	-0,032	-0,019	-0,089	0,208	-0,013	-0,191	0,068	0,098
Salta	0,194	0,066	0,242	0,273	0,128	0,503	0,255	-0,053	-0,040	-0,124	0,324	-0,013	-0,172	0,077	0,141
San Juan	0,176	0,052	0,202	0,257	0,124	0,497	0,251	-0,034	-0,027	-0,105	0,258	-0,007	-0,136	0,055	0,142
San Luis	0,101	0,021	0,152	0,141	0,080	0,447	0,179	-0,022	-0,015	-0,096	0,157	-0,007	-0,132	0,053	0,079
Santa Cruz	0,102	0,009	0,121	0,075	0,093	0,293	0,317	-0,028	0,007	0,041	0,165	-0,035	-0,203	0,171	0,076
Santa Fe	0,095	0,030	0,209	0,146	0,065	0,458	0,142	-0,015	-0,008	-0,032	0,248	-0,007	-0,108	0,069	0,083
Santiago del Estero	0,164	0,045	0,167	0,268	0,119	0,460	0,259	-0,033	-0,026	-0,108	0,243	-0,006	-0,135	0,047	0,130
Tucumán	0,169	0,056	0,227	0,245	0,114	0,529	0,215	-0,035	-0,030	-0,105	0,285	-0,005	-0,084	0,062	0,135
Tierra del Fuego	0,116	0,012	0,190	0,062	0,105	0,445	0,235	-0,026	-0,006	-0,046	0,134	-0,020	-0,181	0,112	0,087
Total país	**0,102**	**0,034**	**0,235**	**0,147**	**0,068**	**0,476**	**0,143**	**-0,023**	**-0,017**	**-0,082**	**0,207**	**-0,006**	**-0,085**	**0,071**	**0,079**

Política fiscal y distribución personal y regional del ingreso en la Argentina

Tabla 11. Coeficientes de Reynolds-Smolensky y sus determinantes. Presupuestos Nacional y Provinciales. Promedio 1995-2001.

1995-2001	g	gN	KgN	gN/(1+t+g)	gP	KgP	gP/(1+t+g)	t	tN	KtN	tN/(1+t+g)	tP	KtP	tP/(1+t+g)	RSp
Ciudad de Bs. As.	0,056	0,022	0,229	0,095	0,034	0,696	0,048	0,011	0,008	0,067	0,116	0,003	0,063	0,045	**0,066**
Buenos Aires	0,077	0,026	0,177	0,147	0,051	0,429	0,120	0,012	0,009	0,045	0,199	0,003	0,046	0,070	**0,090**
Catamarca	0,139	0,018	0,091	0,202	0,121	0,481	0,251	-0,020	-0,017	-0,108	0,161	-0,003	-0,067	0,041	**0,118**
Córdoba	0,083	0,024	0,181	0,135	0,059	0,376	0,157	-0,028	-0,020	-0,109	0,186	-0,008	-0,089	0,085	**0,056**
Corrientes	0,108	0,032	0,195	0,166	0,076	0,355	0,214	-0,019	-0,015	-0,082	0,186	-0,004	-0,063	0,057	**0,090**
Chaco	0,146	0,041	0,238	0,174	0,104	0,364	0,287	-0,029	-0,023	-0,116	0,195	-0,007	-0,094	0,073	**0,116**
Chubut	0,099	0,023	0,160	0,143	0,076	0,380	0,201	-0,014	-0,003	-0,017	0,189	-0,011	-0,126	0,087	**0,085**
Entre Ríos	0,119	0,031	0,191	0,163	0,088	0,364	0,241	-0,022	-0,016	-0,084	0,190	-0,007	-0,069	0,095	**0,097**
Formosa	0,144	0,035	0,235	0,147	0,109	0,317	0,345	-0,038	-0,028	-0,175	0,159	-0,010	-0,177	0,056	**0,107**
Jujuy	0,150	0,036	0,183	0,199	0,114	0,475	0,240	-0,025	-0,021	-0,122	0,170	-0,004	-0,095	0,044	**0,125**
La Pampa	0,102	0,016	0,113	0,143	0,086	0,346	0,248	-0,017	-0,010	-0,058	0,178	-0,007	-0,069	0,094	**0,085**
La Rioja	0,129	0,004	0,021	0,200	0,125	0,405	0,307	-0,013	-0,011	-0,076	0,146	-0,002	-0,052	0,039	**0,114**
Mendoza	0,096	0,024	0,152	0,160	0,072	0,484	0,148	-0,019	-0,012	-0,063	0,191	-0,006	-0,090	0,071	**0,078**
Misiones	0,115	0,039	0,270	0,146	0,076	0,342	0,221	-0,030	-0,023	-0,116	0,199	-0,007	-0,122	0,059	**0,084**
Neuquén	0,102	0,013	0,169	0,079	0,089	0,419	0,212	-0,042	-0,011	-0,110	0,098	-0,032	-0,232	0,136	**0,060**
Río Negro	0,122	0,022	0,140	0,155	0,100	0,541	0,186	-0,032	-0,021	-0,124	0,173	-0,010	-0,173	0,058	**0,090**
Salta	0,171	0,048	0,178	0,272	0,122	0,465	0,263	-0,045	-0,033	-0,120	0,276	-0,012	-0,144	0,083	**0,126**
San Juan	0,155	0,036	0,159	0,224	0,119	0,479	0,249	-0,023	-0,018	-0,094	0,198	-0,004	-0,085	0,052	**0,131**
San Luis	0,073	0,014	0,117	0,116	0,059	0,424	0,139	-0,016	-0,010	-0,085	0,118	-0,006	-0,113	0,051	**0,057**
Santa Cruz	0,069	0,006	0,087	0,065	0,064	0,274	0,233	-0,021	0,001	0,014	0,099	-0,023	-0,183	0,125	**0,048**
Santa Fe	0,083	0,024	0,171	0,141	0,059	0,409	0,143	-0,021	-0,014	-0,078	0,184	-0,006	-0,087	0,071	**0,062**
Santiago del Estero	0,135	0,027	0,107	0,256	0,108	0,452	0,239	-0,021	-0,017	-0,081	0,206	-0,005	-0,100	0,048	**0,113**
Tucumán	0,132	0,039	0,182	0,213	0,093	0,495	0,188	-0,027	-0,024	-0,093	0,260	-0,002	-0,052	0,046	**0,106**
Tierra del Fuego	0,098	0,009	0,135	0,069	0,089	0,441	0,202	-0,016	-0,004	-0,046	0,088	-0,012	-0,147	0,082	**0,079**
Total país	**0,090**	**0,028**	**0,204**	**0,138**	**0,062**	**0,456**	**0,136**	**-0,014**	**-0,011**	**-0,063**	**0,172**	**-0,003**	**-0,046**	**0,067**	**0,076**

Tabla 12: Coeficientes de Reynolds-Smolensky y sus determinantes. Presupuestos Nacional y Provinciales. Promedio 2003-2010.

2003-2010	g	gN	KgN	gN/(1+g)	g P	KgP	gP/(1+g)	t	tN	KtN	tN/(1+g)	tp	KtP	tp/(1+g)	RSp
Ciudad de Bs. As.	0,061	0,023	0,233	0,098	0,038	0,668	0,057	-0,012	-0,007	-0,053	0,139	-0,005	-0,092	0,051	0,048
Buenos Aires	0,095	0,034	0,205	0,167	0,061	0,473	0,128	-0,019	-0,012	-0,044	0,272	-0,007	-0,088	0,077	0,075
Catamarca	0,157	0,033	0,169	0,194	0,124	0,513	0,242	-0,023	-0,011	-0,041	0,259	-0,012	-0,169	0,072	0,134
Córdoba	0,115	0,039	0,239	0,165	0,075	0,431	0,175	-0,022	-0,013	-0,045	0,295	-0,008	-0,095	0,086	0,093
Corrientes	0,180	0,066	0,282	0,233	0,114	0,457	0,250	-0,031	-0,026	-0,090	0,283	-0,006	-0,085	0,067	0,147
Chaco	0,219	0,071	0,315	0,224	0,149	0,442	0,336	-0,046	-0,036	-0,131	0,272	-0,010	-0,119	0,085	0,174
Chubut	0,137	0,029	0,205	0,141	0,108	0,443	0,244	-0,036	0,008	0,028	0,289	-0,044	-0,248	0,178	0,101
Entre Ríos	0,146	0,042	0,230	0,183	0,104	0,423	0,245	-0,031	-0,021	-0,078	0,266	-0,010	-0,112	0,088	0,114
Formosa	0,219	0,058	0,285	0,205	0,160	0,398	0,403	-0,047	-0,035	-0,147	0,237	-0,013	-0,180	0,071	0,172
Jujuy	0,190	0,052	0,235	0,223	0,138	0,526	0,262	-0,029	-0,024	-0,096	0,248	-0,005	-0,138	0,034	0,161
La Pampa	0,187	0,038	0,173	0,220	0,149	0,459	0,324	-0,033	-0,014	-0,052	0,278	-0,019	-0,156	0,123	0,148
La Rioja	0,210	0,038	0,139	0,275	0,171	0,546	0,314	-0,030	-0,024	-0,097	0,245	-0,007	-0,154	0,043	0,180
Mendoza	0,125	0,040	0,226	0,178	0,085	0,539	0,157	-0,030	-0,016	-0,064	0,251	-0,014	-0,183	0,077	0,094
Misiones	0,113	0,047	0,326	0,144	0,066	0,372	0,177	-0,023	-0,018	-0,090	0,201	-0,005	-0,098	0,050	0,089
Neuquén	0,115	0,019	0,240	0,078	0,097	0,441	0,219	-0,055	-0,011	-0,088	0,130	-0,043	-0,262	0,165	0,060
Río Negro	0,139	0,027	0,137	0,194	0,113	0,558	0,202	-0,029	-0,014	-0,056	0,242	-0,015	-0,198	0,078	0,108
Salta	0,218	0,083	0,295	0,281	0,135	0,526	0,257	-0,059	-0,045	-0,119	0,377	-0,014	-0,192	0,073	0,159
San Juan	0,197	0,069	0,240	0,287	0,128	0,503	0,255	-0,045	-0,034	-0,106	0,317	-0,011	-0,181	0,060	0,153
San Luis	0,131	0,031	0,183	0,168	0,100	0,471	0,213	-0,028	-0,020	-0,104	0,198	-0,008	-0,141	0,055	0,101
Santa Cruz	0,135	0,012	0,141	0,085	0,123	0,307	0,400	-0,030	0,014	0,064	0,225	-0,044	-0,209	0,213	0,105
Santa Fe	0,108	0,037	0,239	0,154	0,071	0,496	0,143	-0,004	0,004	0,012	0,311	-0,008	-0,122	0,068	0,103
Santiago del Estero	0,192	0,062	0,220	0,279	0,130	0,460	0,282	-0,043	-0,035	-0,126	0,279	-0,007	-0,166	0,045	0,147
Tucumán	0,211	0,075	0,271	0,277	0,136	0,556	0,244	-0,044	-0,036	-0,113	0,314	-0,009	-0,115	0,077	0,165
Tierra del Fuego	0,133	0,013	0,225	0,058	0,120	0,447	0,269	-0,037	-0,009	-0,052	0,176	-0,027	-0,199	0,138	0,096
Total país	**0,115**	**0,041**	**0,258**	**0,157**	**0,074**	**0,491**	**0,151**	**-0,031**	**-0,022**	**-0,092**	**0,242**	**-0,009**	**-0,113**	**0,075**	**0,083**

Política fiscal y distribución personal y regional del ingreso en la Argentina